Exhibit C

RAILROAD GONDOLA CAR STRUCTURE AND MECHANISM THEREFOR

[0001] This application is a divisional application of U.S. Patent Application Serial Number 12/559,065 entitled "Railroad Gondola Car Structure and Mechanism Therefor," filed September 14, 2009, which claims priority under 35 USC 119 to Canadian Patent Application Serial Number 2,678,447, entitled "Railroad Gondola Car Structure and Mechanism Therefor" filed September 11, 2009, and Canadian Patent Application Serial Number 2,678,605, entitled "Railroad Gondola Car Structure and Mechanism Therefor" filed September 14, 2009. U.S. Patent Application Serial Number 12/559,065 is incorporated herein by reference.

Field of the Invention

[0002] This invention relates to the field of railroad freight cars, and, in particular to rail road gondola cars such as may employ bottom unloading gates or doors.

Background

[0003] There are many kinds of rail road cars for carrying particulate material, be it sand or gravel aggregate, plastic pellets, grains, ores, potash, coal or other granular materials. Many of those cars have an upper opening, or accessway of some kind, by which the particulate is loaded, and a lower opening, or accessway, or gate, or door by which the particulate material exits the car under the influence of gravity. While the inlet opening need not necessarily have a movable gate, the outlet opening requires a governor of some kind that is movable between a closed position for retaining the lading while the lading is being transported, and an open position for releasing the lading at the destination. The terminology "flow through" or "flow through rail road car" or "center flow" car, or the like, may sometimes be used for cars of this nature where lading, typically particulate lading, is introduced at the top, and flows out at the bottom.

[0004] Discharge doors for gondola cars or other bottom dumping cars may tend to have certain desirable properties. First, to the extent possible it is usually desirable for the door opening to be large so that unloading may tend to be relatively fast, and for the sides of any unloading chute to be relatively steep so that the particulate will tend not to hang up on the slope. Further, to the extent that the door can be large and the slope sheets steep, the interior of the car may tend to have a

greater lading volume for a given car length. Further still, any increase in lading achieved will tend to be at a relatively low height relative to Top of Rail (TOR) and so may tend to aid in maintaining a low center of gravity. A low center of gravity tends to yield a better riding car that is less prone to derailment, and perhaps less prone to cause as much wear or damage to tracks.

[0005] For a given length of car, hopper volume, and hence overall car volume, can be maximized by reducing the proportion of the length of the car occupied by the trucks, and occupied by the door opening drive mechanism. Furthermore, where the lading to be carried by the car is of greater than usual density, it may often be helpful for the truck center length to be relatively short such that the length of the span between the trucks is smaller, and the weight of the structure may be correspondingly decreased relative to the maximum permissible gross weight on rail for the car. In some instances, as with iron ore or other high density lading, that truck center distance may be very short.

[0006] It may also be that in some circumstances ore cars are used in quasi-permanent sets that form a unit train. The unit train may tend to follow a single route for substantially its entire operational service life. In the case of an ore car, that operational route may be from a mine or concentrator facility, at which the cars receive the lading; to a discharge facility, whether a mill or a break of bulk terminal at a port. In these circumstances the line may be owned by the mine or mill, and the cars may not necessarily be used for interchange service. To the extent that they are not used for interchange service they may not necessarily comply with all AAR standards. The cars may have short, possibly non-standard draft sills, draft gear, and couplers, or a combination thereof.

[0007] The cars may have tightly limited space envelopes over the end shear plates, and yet these spaces may nonetheless be intended to accommodate, for example, the brake reservoir and pneumatic gear for operating the gondola discharge doors.

Summary of the Invention

[0008] In an aspect of the invention there is a railroad hopper car. It has at least one hopper having a bottom discharge, the bottom discharge including a door movable between a closed position for retaining lading and an open position for permitting egress of lading. The hopper is carried on spaced apart railroad cars trucks for rolling motion along railroad tracks in a lengthwise direction of the car. The hopper has at least a first end slope sheet inclined downwardly in the lengthwise direction toward the door. There is a linkage connected to the door. The linkage is oriented lengthwise with respect to the car. A drive is connected to the linkage. The drive is operable to

move the linkage and thereby to urge the door to a closed position. The linkage is movable from a first position corresponding to the open position of the door to a second position corresponding to the closed position of the door. The linkage includes at least a drag link. When the linkage moves from the first to the second position one of (a) the overall motion from the first to the second position includes displacement of the drag link in a direction having a predominant component of motion parallel to the first end slope sheet; and (b) the motion of the drag link is at least instantaneously parallel to the first end slope sheet.

[0009] In another feature of that aspect of the invention the linkage includes a first pivot arm pivotally connected to a datum structure at a first pivot connection. The drive is also mounted to the datum structure. The linkage includes a second pivot arm pivotally connected to the datum structure at a second pivot connection. The second pivot arm has the door mounted thereto. The first pivot arm has a second connection distant from the first pivot connection. The second pivot arm has a second connection distant from the second pivot connection. A mechanical transmission is mounted between the second connection of the second pivot arm and the second connection of the first pivot arm. The mechanical transmission includes the drag link. The drive is connected to move the first pivot arm, and, in moving from the first position to the second position, each position of the first pivot arm being associated with a unique position of the drag link. In a further feature, the linkage includes left and right hand first pivot arms pivotally connected to a datum structure at respective first pivot connections, the respective first pivot connections being co-axial. The linkage includes left and right hand second pivot arms pivotally connected to the datum structure at respective second pivot connection. The door is a left hand door of a pair of co-operable right and left hand doors, the left hand door being mounted to the left hand second pivot arm and the right hand door being mounted to the right hand second pivot arm. Each first pivot arm has a respective second connection distant from its respective first pivot connection, the respective second connections being pivot connections and being mutually co-axial. Each second pivot arm has a respective second connection distant from the respective second pivot connection. A mechanical transmission is mounted between the respective second connections of the second pivot arms and the respective second connections of the first pivot arms. The drag link is a left hand drag link, and the mechanical transmission includes a mated parallel right hand drag link. The left and right hand drag links each have a first end mounted to one of the respective second connections of the first pivot arms. The left and right hand drag links have second ends yoked together distantly from the first ends. The transmission member includes left and right hand slave links extending between and connecting the second ends of the drag links to the second connections of the second pivot arms respectively.

[0010] In still another feature, the linkage includes left and right hand first pivot arms

pivotally connected to a datum structure at respective first pivot connections, the respective first pivot connections being co-axial. The linkage includes left and right hand second pivot arms pivotally connected to the datum structure at respective second pivot connection. The door is a left hand door of a pair of co-operable right and left hand doors, the left hand door being mounted to the left hand second pivot arm and the right hand door being mounted to the right hand second pivot arm. Each first pivot arm has a respective second connection distant from its respective first pivot connection, the respective second connections being pivot connections and being mutually co-axial. The left and right hand pivot arms co-operate to define a bifurcated lever straddling the drive. In yet another feature, the drive includes an actuating cylinder having an axially reciprocating member, the axially reciprocating member being inclined relative to horizontal. In still another feature the drag link lies between the actuating cylinder and the first end slope sheet of the hopper. In another feature the railroad hopper car includes a first end section, the first end section includes a draft sill and a substantially horizontal shear plate mounted over the draft sill, the drive includes an actuating cylinder having an axis of reciprocation lying in a central vertical-lengthwise plane of the car, the actuating cylinder is mounted above the shear plate, the first end slope sheet at least partially overhangs the actuating cylinder; and the drag link is located between the actuating cylinder and the first slope sheet.

[0011] In another aspect of the invention there is a railroad hopper car. It has at least one hopper having a bottom discharge, the bottom discharge including a gate movable between a closed position for retaining lading and an open position for permitting egress of lading. The car includes structure by which the hopper is carried on spaced apart railroad cars trucks for rolling motion along railroad tracks in a lengthwise direction of the car. A door operating linkage is connected to the gate, the door operating linkage being oriented lengthwise with respect to the car. An actuating cylinder connected to drive the door operating linkage, the actuating cylinder also being oriented to act lengthwise with respect to the car, the actuating cylinder having an axis of reciprocation. The axis of reciprocation being tilted such that displacement of the actuating cylinder includes a vertical component of motion.

[0012] In another feature of that aspect of the invention, the hopper car includes an end section mounted over one of the trucks, the end section includes a substantially horizontal shear plate, and the actuating cylinder is mounted on a pedestal mounted to the shear plate, the pedestal including an inclined mounting for the cylinder. In a further feature, the railroad hopper car has a longitudinal-vertical central plane, and the axis or reciprocation lies in the longitudinal-vertical plane. In a still further feature, the hopper includes at least a first end slope sheet extending longitudinally and being inclined longitudinally inboard and downwardly toward the gate, and at

least part of the actuating cylinder is overhung by at least part of the first end slope sheet. In a yet further feature, the hopper car includes an end section having a substantially horizontal shear plate mounted over a draft sill. The hopper includes a first end slope sheet, the first end slope sheet at least partially overhanging the horizontal shear plate. The actuating cylinder is mounted above the shear plate, centrally aligned over the draft sill. The actuating cylinder is at least partially overhung by the first end slope sheet. In still yet anther further feature the first slope sheet is substantially planar and has a first angle of inclination relative to horizontal. The actuating cylinder is inclined longitudinally inboard downwardly, and is inclined at a second angle. The second angle lies between horizontal and the first angle. In yet another feature the car has an underframe and the door operating linkage includes a first linkage component, a second linkage component, a third linkage component, and a fourth linkage component. The first linkage component is a reference datum component and includes structure immovable relative to the underframe. The second linkage component is a first pivot linkage mounted to the first linkage component at a main pivot connection, the first pivot linkage being a first pivot arm constrained to pivot on an axis of rotation oriented horizontally cross-wise relative to the underframe. The fourth linkage component is a second pivot linkage pivotally mounted to the first linkage component and includes at least the gate. The third linkage component includes a drag link element connected to the first pivot arm, the drag link element having at least a first pivotal attachment to at least a portion of the fourth linkage component, whereby input motion of the second linkage component uniquely determines position and motion of the third and fourth linkage components relative to the first linkage component. Motion of the second linkage component is driven by the actuator. In still another feature the main pivot connection of the first pivot arm to the first linkage component is located lower than the actuating cylinder. In yet still another feature, the drag link element is connected to the first pivot arm at a distal pivot connection relative to the main pivot connection, and, when the gate is in the closed position and the car is viewed in side view, the actuating cylinder is located between the main pivot connection and the distal pivot connection.

[0013] In another aspect there is a railroad hopper car. It has at least one hopper having a bottom discharge, the bottom discharge including a gate movable between a closed position for retaining lading and an open position for permitting egress of lading. It has first and second end sections to which the hopper is mounted, the first and second end sections being mounted to respective first and second railroad car trucks for rolling motion along railroad tracks in a lengthwise direction of the car. There is a door operating linkage connected to the gate, the door operating linkage being oriented lengthwise with respect to the car and connected. An actuating cylinder is connected to drive the door operating linkage. The actuating cylinder is also oriented to act in a lengthwise extending plane with respect to the car. The actuating cylinder has an axis of

reciprocation. The door operating linkage includes a first pivot arm pivotally mounted to the first end section at a first pivot connection. There is a mechanical transmission connected between the first pivot arm and the gate. The mechanical transmission includes at least a drag link movably connected to the first pivot arm at a location distant from the first pivot connection. The first pivot connection is lower than the actuating cylinder as seen when viewing the first end section in side view.

[0014] In another feature of that aspect of the invention, when the gate is in the closed position and the car is viewed in side view, the actuating cylinder is located between the main pivot connection and the distal pivot connection. In still another feature, the actuating cylinder drives an intermediate lever that is connected to drive the first pivot arm.

[0015] In another aspect of the invention there is a rail road hopper car. It has a hopper carried between a pair of trucks, the hopper having first and second upstanding sidewalls running lengthwise therealong. The hopper has a lower discharge and convergent slope sheets giving onto the discharge. The rail road car has a side sill and a top chord. The first upstanding sidewall extends from the side sill to the top chord. The first upstanding sidewall has a predominantly upwardly running sidewall stiffener mounted thereto. The sidewall stiffener is located at a longitudinal station intermediate the trucks. The first upstanding sidewall has a first region, the first region being a lower region thereof. The first upstanding sidewall has a second region. The second region is an upper region thereof. The sidewall stiffener has a first portion, the first portion being a lower portion thereof. The first portion is mounted to the first region of the first upstanding sidewall. The sidewall stiffener has a second portion, the second portion being an upper portion thereof. The second portion is mounted to the second region of the upstanding sidewall. The first portion of the first upstanding sidewall stiffener is laterally outboard of the first region of the first upstanding sidewall. The second portion of the sidewall stiffener is laterally inboard of the second region of the first upstanding sidewall. The sidewall has a continuous section between the first and second regions thereof. The sidewall stiffener has web continuity between the first and second portions thereof.

[0016] In a feature of that aspect of the invention, the first and second portions of the sidewall stiffener are substantially co-planar, and are substantially vertically aligned when seen in a sectional view looking along the car. In another feature, the first upstanding sidewall has a third region intermediate the first and second regions. The third region includes a side sheet transition portion passing across the sidewall stiffener from an inboard margin thereof to an outboard margin thereof, and the stiffener has vertical web continuity through the transition portion. In another feature, the first upstanding sidewall has a third region intermediate the first and second regions.

The third region includes a side sheet transition portion passing across the sidewall stiffener from an inboard margin thereof to an outboard margin thereof. The hopper includes first and second sloped side sheets. The first sloped side sheet meets the first sidewall at the transition portion. In another feature, the first sidewall has an overall height from the side sill to the top chord, L, and the transition is located a distance above the side sill that is in the range of ¼ to 2/3 L. In a still further feature the first sidewall has an overall height from the side sill to the top chord, L, and the first slope sheet meets the transition at an height that is in the range of ¼ to 2/3 L above the side sill.

[0017] In a further aspect of the invention there is a railroad hopper car. It has at least one hopper having a bottom discharge, the bottom discharge having a bottom discharge governor movable between a closed position for retaining lading and an open position for permitting egress of lading. The car has structure by which the hopper is carried on spaced apart railroad cars trucks for rolling motion along railroad tracks in a lengthwise direction of the car. The hopper has a door operating linkage oriented lengthwise with respect to the car. There is an actuating cylinder also oriented to act in a lengthwise extending plane with respect to the car, the actuating cylinder being connected to drive the door operating linkage. The door operating linkage includes a pair of first and second linkage members co-operably mounted to either transverse side of the actuating cylinder, whereby the actuating cylinder is bracketed by the linkage members.

[0018] In another feature of that aspect of the invention, the car has an underframe and the linkage is a closed loop bar linkage in which there is a first linkage component, a second linkage component, a third linkage component, and a fourth linkage component. The first linkage component is a reference datum component and includes structure immovable relative to the underframe. The second linkage component is a first pivot linkage mounted to the first linkage component at a main pivot connection, and which includes the first and second linkage members, the first and second linkage members being a matched pair of left and right hand pivot arms constrained to pivot on a common axis of rotation relative to the underframe. The fourth linkage component is a second pivot linkage pivotally mounted to the first linkage component and which includes at least one pivotally mounted door assembly defining the bottom discharge governor. The third linkage component includes a drag link element having at least a first pivotal attachment to at least a portion of the fourth linkage component, whereby input motion of the second linkage component uniquely determines position and motion of the third and fourth linkage components relative to the first linkage component. Motion of the second linkage component is driven by the actuator.

[0019] In another feature the hopper includes a hopper end slope sheet. The end slope sheet extends substantially in a plane inclined downwardly and lengthwise inwardly toward the bottom

discharge. Displacement of the third linkage component associated with motion of the door assembly between the open position is predominantly in a direction generally parallel to the end slope sheet. In another feature the hopper includes a hopper end slope sheet. The end slope sheet extends substantially in a plane inclined downwardly and lengthwise inwardly toward the bottom discharge. During at least an instantaneous portion of motion of the third linkage component while the door assembly is in a position between the open position and the closed position the third linkage component moves parallel to the end slope sheet. In still another feature the third linkage component includes at least a first element and a second element mounted thereto. The first element is pivotally mounted to the first linkage component, and is constrained to move in a lengthwise-vertical plane relative to the first linkage component. The second element has a first connection to the first component the first connection being a pivot connection. The second element has a second connection to the fourth linkage component, the second connection having at least one degree of freedom of motion. The second element is constrained always to be co-planar with the first connection, the second connection, and the main pivot connection. In yet still another feature, the bottom discharge governor includes a door,. The actuating cylinder is connected to drive the door operating linkage through a lever assembly. The lever assembly has an over-center lock that is operable to prevent release of the bottom gate to the open position when the actuating cylinder is inactive. In yet a further feature, motion of the first pivot linkage occurs in a longitudinal-vertical plane. The second pivot linkage moves in a plane generally cross-wise to the longitudinal-vertical plane. In still a further feature the main pivot connection is beneath the actuating cylinder when the hopper car is seen in side view. In again another feature one of (a) the main pivot is beneath the drag link element; and (b) the actuating cylinder is between the main pivot and the drag link element. In a yet still further feature, the hopper includes at least a first end slope sheet, and the bottom discharge governor includes a door. The first end slope sheet is inclined longitudinally downwardly and inboard toward the door. The drag link element is inclined on a slope predominantly parallel to, and adjacent to, the first end slope sheet. The actuating cylinder is oriented along the lengthwise direction, and is also tilted longitudinally downwardly and inwardly toward the door.

[0020] In another aspect of the invention there is a railroad hopper car. It has at least one hopper carried by railroad car trucks for motion in a lengthwise direction of the car along railroad tracks. The hopper has a bottom discharge. The bottom discharge has a door movable between a closed position for retaining lading and an open position for permitting egress of lading. A mechanical transmission is connected to the door. The mechanical transmission is oriented lengthwise with respect to the car. A door actuator is connected to the mechanical transmission and is operable to urge the door from the open position toward the closed position, the door actuator being oriented to reciprocate in a first direction. The hopper car has a first lock operable to prevent

movement of the door from the closed position to the open position when the door actuator is inactive. The hopper car has a second lock operable to prevent movement of the door from the closed position to the open position when the door actuator is inactive if the first lock should fail. The second lock is movable between an engaged position in which it prevents movement of the door to the open position thereof. In moving between the engaged and disengaged positions, the second lock has a displacement that is predominantly cross-wise to the first direction of the reciprocation of the door actuator.

[0021] In another feature of that aspect of the invention, the car has a central lengthwise-vertical plane, the door actuator is positioned to reciprocate in the central lengthwise-vertical plane, and the second lock is movable between the engaged and disengaged positions in motion predominantly transverse to the central lengthwise-vertical plane. In another feature, the second lock is mounted on an hinge and pivots in a circumferential direction between the engaged and disengaged positions. In still another feature the second lock is mounted on an hinge, the hinge has an axis lying parallel to the lengthwise vertical plane, and the second lock pivots circumferentially between the engaged and disengaged positions. In another feature, the second lock is biased toward the engaged position. In still another feature, the second lock is biased toward the engaged position. In yet another feature the apparatus is one in which one of: (a) the second lock has a cam and the actuator has a mating cam follower; and (b) the second lock has a cam follower and the actuator has a mating cam. The cam and cam follower are co-operable, and are oriented to deflect the second lock away from the engaged position as the door moves from the open position to the closed position thereof.

[0022] In another aspect of the invention, there is a lock mechanism for a door actuating transmission of a railroad gondola car, the door actuating transmission including a reciprocating actuating cylinder mounted to a datum structure, the cylinder being movable forward and backward in an axial direction. The lock mechanism has a body having a first fitting, a second fitting and a third fitting. The first fitting is a mounting by which to connect the lock mechanism to the datum structure. The second fitting is one of (a) a cam for co-operation with a member of the door actuating transmission, that member being a cam follower; and (b) a cam follower for co-operation with a member of the door actuating transmission, that member being a cam. The third fitting includes an abutment for co-operation with a mating fitting of the door actuating transmission. The third fitting is movable between a first position and a second position, in the first position the abutment being presented to obstruct motion of the mating fitting of the door actuating transmission and thereby to prevent the door from moving to an open position thereof. The second fitting is movable between a first position and a second position, in the first position thereof the second fitting

being positioned to intercept the member of the door actuating transmission and to be deflected away from the first position toward the second position thereby. The first fitting has a first degree of freedom of motion permitting the first and second fittings to move between their respective first and second positions. The degree of freedom constrains the third fitting to motion predominantly cross-wise to the axial direction.

[0023] In another feature, the lock mechanism there has a bias member oriented to urge the third fitting toward the first position thereof. The bias member is a spring having a first end and a second end, the first end being mounted to bear against the body of the lock mechanism, the second end having a foot for reaction against the datum structure. In another feature, the first degree of freedom of motion is an angular degree of freedom, and the predominantly cross-wise motion is predominantly circumferential motion about an axis of rotation. In a feature the first fitting is an hinge, the axis of rotation is an axis of rotation of the hinge, and the axis of rotation of the hinge is substantially parallel to the axial direction of the door actuating transmission. In still another further feature, the first fitting of the lock mechanism includes an hinge and a footing of the hinge for mounting to the datum structure. The axis of rotation is an axis of rotation of the hinge, and the footing has a substantially planar footprint. The axis of rotation of the hinge is angularly inclined relative to the substantially planar footprint. In yet another feature, the lock mechanism has all or any combination of the forgoing additional features.

[0024] In still another aspect of the invention there is a railroad hopper car for carrying particulate material. The hopper car there has a hopper and first and second end sections for carriage by respective first and second rail road car trucks for rolling motion along railroad tracks in a longitudinal direction. The hopper is suspended between the first and second end sections. The hopper has a discharge section through which to release lading, and first and second end slope sheets oriented toward the first and second end sections, the slope sheets being inclined in the longitudinal direction to feed the discharge section. The first end section includes a draft sill extending in the longitudinal direction, a main bolster extending cross-wise to either side of the draft sill, and a shear plate mounted to the draft sill and to the main bolster. The shear plate extends lengthwise along the draft sill and cross-wise from side to side of the hopper car. The first end slope sheet of the hopper overhangs the shear plate of the first end section. The hopper car is free of primary structure directly above the shear plate of the first end section under the overhang of the first slope sheet of the hopper.

[0025]

[0026] In another feature of that aspect of the invention, there is one of: (a) the first slope sheet has an upper margin and the hopper car includes an end post extending upwardly from the draft sill to the upper margin of the slope sheet; and (b) the first slope sheet has an upper margin

terminating at an end wall, and the hopper car includes an end post extending upwardly from draft stub sill to the end wall. In another feature, the shear plate has a longitudinally outboard margin and the draft sill has a striker located outboard of the longitudinally outboard margin of the shear plate, and the end post is one of: (a) rooted to the draft sill adjacent to the striker; (b) rooted to the shear plate adjacent to the longitudinally outboard margin of the shear plate. In a further feature, the bolster has first and second laterally outboard distal ends, and the hopper car has corner posts extending upwardly from the distal ends of the hopper to the first slope sheet.

[0027] In still another feature, the bolster has first and second laterally outboard distal ends, and the hopper car has corner posts extending upwardly from the distal ends of the hopper to the first slope sheet. In another feature, one of: (a) the first slope sheet has an upper margin and the hopper car includes an end post extending upwardly from the draft sill to the upper margin of the slope sheet; and (b) the first slope sheet has an upper margin terminating at an end wall, and the hopper car includes an end post extending upwardly from draft stub sill to the end wall; the shear plate has a longitudinally outboard margin and the draft sill has a striker located outboard of the longitudinally outboard margin of the shear plate, and the end post is one of: (a) rooted to the draft sill adjacent to the striker; (b) rooted to the shear plate adjacent to the longitudinally outboard margin of the shear plate. The bolster has first and second laterally outboard distal ends, and the hopper car has corner posts extending upwardly from the distal ends of the hopper to the first slope sheet. The hopper car has a machinery space bounded by (a) the first slope sheet; (b) the shear plate of the first end section; (c) the end post; and (d) the corner posts, and the machinery space is free of any other primary structure.

[0028] In yet another feature the hopper car has at least one longitudinally hinged discharge door, the discharge door being movable cross-wise between open and closed positions. A longitudinally acting pneumatic actuator is at least partially lodged in the machinery space directly above the draft sill. In still yet another feature a brake reservoir is also at least partially lodged in the machinery space. In a yet further feature the shear plate is mounted above and to the main bolster and defines an upper flange thereof. The main bolster has a lower flange downwardly spaced from the upper flange, the lower flange terminating at respective distal end portions at either side of the car. The car includes a side sill running along the car between the first and second end sections. The side sill has an upper flange, the upper flange of the side sill being substantially co-planar and connected to the shear plate. The side sill has a lower flange, the lower flange of the side sill being substantially co-planar with a respective one of the distal end portions of the lower flange of the main bolster. In another further feature, the shear plate defines an upper flange of the draft sill whereby the draft sill upper flange, the shear plate and the side sill upper flange are all substantially

co-planar. In another feature the machinery space is free of elephant ears.

[0029] In a further aspect of the invention there is a railroad freight car having a freight car body for carrying lading, the body being mounted on railroad car trucks for rolling motion in a longitudinal direction along railroad tracks. The car body includes a draft sill having a draft gear pocket for accommodating draft gear, and a shear plate overlying the draft sill and functioning as an upper flange of the draft sill. The draft sill has an inboard end oriented toward a truck center of one of the trucks, and an outboard end terminating at a striker. The draft sill has an underside and an access opening formed in the underside to admit entry of draft gear into the draft gear pocket from below. The car has a draft gear carrier plate. The carrier plate is mounted to the underside of the draft sill beneath the draft gear pocket. The carrier plate is removable to permit installation of the draft gear into the draft gear pocket. The car body has one of (a) an aperture formed in the shear plate over an inboard end region of the draft sill, the aperture permitting a portion of the draft gear to protrude upwardly therethrough during installation in the draft gear pocket; and (b) a coupler carrier seat defined in the draft sill longitudinally inboard of the striker, and a coupler carrier co-operable therewith, the coupler carrier being removable to permit installation of draft gear in the draft pocket, and, when the coupler carrier is installed, the coupler carrier providing a support for a coupler shank when the coupler shank is connected to the draft gear within the draft sill.

[0030] In another feature of that aspect of the invention the freight car has both (a) and (b). In another feature, there is a cover plate for the aperture of the shear plate, the cover plate being removable to permit installation of the draft gear. In still another feature, the draft sill has a pair of vertically oriented, longitudinally running spaced apart side webs. The webs have a greater depth of section adjacent to the striker. The webs have respective first and second apertures formed therein. The first and second apertures define the draft gear retainer seat, and the retainer is a sideways slidable shaft that is movable to extend across the draft sill between the first and second apertures in the draft sill side webs. In a further feature there is a cover plate for the aperture of the shear plate, the cover plate being removable to permit installation of the draft gear. In another further feature the draft sill has a centerplate centered on the truck center, rear draft stops are welded within the draft sill, and at least a portion of each of the rear draft stops extends longitudinally inboard of the truck center. In still another further feature, the car is one in which at least one of (a) the freight car has a truck center to striker plate draft sill length of less than 50 inches; and (b) the freight car has a truck center to coupler pulling face length of less than 65 inches when the draft gear is fully extended in draft. In another feature, the railroad freight car is one in which at least one of (a) the freight car has a truck center to striker plate draft sill length of about 38 inches (+/- 2"); and (b) the freight car has a truck center to coupler pulling face length of about 53 inches (+/- 2") when the draft gear is fully

extended in draft.

[0031] These and other aspects and features of the invention may be understood with reference to the description which follows, and with the aid of the illustrations.

Brief Description of the Figures

[0032] The description is accompanied by a set of illustrative Figures in which:

[0033] Figure **1** is a general arrangement, isometric view of a railroad freight car according to an aspect of the invention with all ancillary systems removed to leave only primary structure visible;

[0034] Figures **2a** is an isometric view of a sidewall of the gondola car of Figure **1**;

[0035] Figure **2b** shows a side view of the sidewall of Figure **2a**;

[0036] Figure **2c** shows an end view of the sidewall of Figure **2a**;

[0037] Figure **3a** shows a perspective view of the end structure of the railroad freight car of Figure **1**;

[0038] Figure **3b** is a side view of the structure of Figure **3a**;

[0039] Figure **3c** is a detail of the end structure of Figure **3b**, with the near side web of the draft sill removed to show the draft stop, center plate, and coupler relationship.

[0040] Figure **4a** is a isometric view of a portion of the door opening mechanism for the railroad car of Figure **1** in a fully open position;

[0041] Figure **4b** is a isometric view of a portion of the door opening mechanism for the railroad car of Figure **1** in an intermediate position;

[0042] Figure **4c** is a isometric view of a portion of the door opening mechanism for the railroad car of Figure **1** in a fully closed position;

[0043] Figure **5a** is a side view of the door opening mechanism of Figure **4a**;

[0044] Figure **5b** is a side view of the door opening mechanism of Figure **4b**;

[0045] Figure **5c** is a side view of the door opening mechanism of Figure **4c**;

[0046] Figure **6a** is an end view of the door opening mechanism of Figure **4a**;

[0047] Figure **6b** is an end view of the door opening mechanism of Figure **4b**; and

[0048] Figure **6c** is an end view of the door opening mechanism of Figure **4c**;

[0049] Figure **7a** is a perspective view of a secondary lock mechanism for the door opening mechanism of Figure **4a**;

[0050] Figure **7b** is a plan view of the mechanism of Figure **7a**;

[0051] Figure **7c** is a perspective view of the mechanism of Figure **7a** when the door are open

[0052] Figure **7d** is a view similar to Figure **7c**, of the mechanism of Figure **7a** in a deflected condition; and

[0053] Figure **7e** is a perspective view of the mechanism of Figure **7a** in a locked position;

Detailed Description

[0054] The description that follows, and the embodiments described therein, are provided by way of illustration of an example, or examples, of particular embodiments of the principles, aspects or features of the present invention. These examples are provided for the purposes of explanation, and not of limitation, of those principles and of the invention. In the description, like parts are marked throughout the specification and the drawings with the same respective reference numerals. The drawings may be taken as being to scale unless noted otherwise.

[0055] The terminology used in this specification is thought to be consistent with the customary and ordinary meanings of those terms as they would be understood by a person of ordinary skill in the rail road industry in North America. Following from decision of the CAFC in *Phillips* v. *AWH Corp.*, the Applicant expressly excludes all interpretations that are inconsistent with this specification, and, in particular, expressly excludes any interpretation of the claims or the language used in this specification such as may be made in the USPTO, or in any other Patent Office, other than those interpretations for which express support can be demonstrated in this specification or in objective evidence of record in accordance with *In re Lee*, (for example, earlier publications by persons not employed by the USPTO or any other Patent Office), demonstrating how the terms are used and understood by persons of ordinary skill in the art, or by way of expert evidence of a person or persons of at least 10 years experience in the industry in North America or in other former territories of the British Empire and Commonwealth.

[0056] In terms of general orientation and directional nomenclature, for rail road cars described herein the longitudinal direction is defined as being coincident with the rolling direction of the rail road car, or rail road car unit, when located on tangent (that is, straight) track. In the case of a rail road car having a center sill, be it a stub sill or a straight-through center sill, the longitudinal direction is parallel to the center sill, and parallel to the top chords. Unless otherwise noted, vertical, or upward and downward, are terms that use top of rail, **TOR**, as a datum. In the context of the car as a whole, the term lateral, or laterally outboard, or transverse, or transversely outboard refer to a distance or orientation relative to the longitudinal centerline of the railroad car, or car unit, or of the

centerline of a centerplate at a truck center. The term "longitudinally inboard", or "longitudinally outboard" is a distance taken relative to a mid-span lateral section of the car, or car unit. Pitching motion is angular motion of a railcar unit about a horizontal axis perpendicular to the longitudinal direction. Yawing is angular motion about a vertical axis. Roll is angular motion about the longitudinal axis. Given that the rail road car described herein may tend to have both longitudinal and transverse axes of symmetry, a description of one half of the car may generally also be intended to describe the other half as well, allowing for differences between right hand and left hand parts. In this description, the abbreviation kpsi stands for thousand of pounds per square inch. To the extent that this specification or the accompanying illustrations may refer to standards of the Association of American Railroads (AAR), such as to AAR plate sizes, those references are to be understood as at the earliest date of priority to which this application is entitled.

[0057] Bottom dumping hopper cars, of which ore cars and coal cars may be examples, may tend to have either longitudinal doors or transverse doors. Longitudinal doors are oriented such that the doors operate on hinges or axes of rotation that are parallel to the direction of travel of the railroad car generally. US Patent 4,250,814 of Stark et al., issued February 17, 1981 and US Patent 3,800,711 of Tuttle, issued April 2, 1974 show cars with longitudinal doors. By contrast, transverse doors are ones in which the axes of rotation of the hinges or other pivots tend to be predominantly cross-wise to the direction of travel, most often perpendicular to it. An example of a transverse door car shown in US Patent 4,843,974 of Ritter et al, issued July 4, 1989.

[0058] Figure **1** shows an isometric view of an example of a rail road freight car **20** that is intended to be representative of a range of rail road cars in which one or more of the various aspects of the present invention may be incorporated. While car **20** may be suitable for a variety of general purpose uses, it may be taken as being symbolic of, and in some ways a generic example of, a flow through car, in which lading is introduced by gravity flow from above, and removed by gravity discharge through gated or valved outlets below. Flow through, or center flow cars may include open topped hopper cars, grain cars, plastic pellet cars, potash cars, ore cars, coal gondolas, and so on. In one embodiment car **20** may be a hopper car such as may be used for the carriage of bulk commodities in the form of a granular particulate, be it in the nature of relatively coarse gravel or fine aggregate in the nature of fine gravel or sand or various ores, ore concentrate or coal. The principle, or primary, structure of car **20** may be symmetrical about both its longitudinal and transverse, or lateral, centerline axes. Consequently, it will be understood that the car has first and second, left and right hand side beams, bolsters and so on.

[0059] By way of a general overview, car **20** may have a car body **22** that is carried on trucks **24** for rolling operation along railroad tracks. Car **20** may be a single unit car, or it may be a multi-unit car having two or more car body units, where the multiple car body units may be substantially permanently connected at an articulated connector, or by draw bars, as opposed to by ordinarily releasable AAR couplers. Car body **22**, and the various structural members and fittings described herein may be understood to be typically of metal construction, whether welded or Huck(t.m.) bolted, or riveted together, the metal members being most typically steel, stainless steel, or aluminum, as may be appropriate. Some car builders have also used reinforced plastic composites for car elements, and those materials could also be employed where suitable. The default construction may be taken as being steel, of which the majority may be mild steel having, typically, a 50 kpsi yield. Car body **22** may have a lading containment vessel or shell **26** such as may include an upstanding wall structure **28** which may have a pair of opposed first and second end walls **30**, **32**, that extend cross-wise, and a pair of first and second side walls **34**, **36** that extend lengthwise, the end walls **30**, **32** and side walls **34**, **36** co-operating to define a generally rectangular form of peripheral wall structure **28**. Wall structure **28** may include top chords **38** running along the top of the walls, and side sills **40** running fore-and-aft along lower portions of the side sheets or side sheet assemblies **42** of side walls **34**, **36**. In some instances, such as that of the illustration of Figure **1a**, car **20** may have stub center sills **44** at either end, in which case side walls **34**, **36** may act as deep beams, and may carry vertical loads to main bolsters **90** that extend laterally from the centerplates. In the case of a single, stand alone car unit, draft gear and releasable couplers may be mounted at either end of the stub center sill. In a center flow, or flow through car, the upper portion of the car may typically include means by which to admit lading under a gravity drop system. Such an intake **46**, or entryway may be a large rectangular opening such as that bounded by top chords **38**.

[0060] Car body **22** may include end sheets **48** and side sheets **50**. Car **20** of Figures **1** et seq., is illustrated as a car having a single hopper **52**, a single hopper discharge section **54**, and an outflow or discharge governor in the nature of a discharge door assembly **56**. However, car **20** could, alternatively, be a multiple hopper car. In a multiple hopper car, the car may have laterally extending members or reinforcements, which may be cross-bearers, or cross-bearers with shrouds, or merely shrouds, particularly where the car is a multiple hopper car. These cross-members may run fully across the car from side sill to side sill, and may intersect the center sill, or the center sill shroud as may be. The car may also include upper wall bracing, in the nature of diagonal struts which extend diagonally upwardly and outwardly from the apices of the respective cross-members at the centerline of the car to upper regions of the side walls near or at the top chords; and lateral ties or struts that run across the car from sidewall to side wall to meet the upper ends of the diagonal struts

at their wall brackets. Those brackets may be aligned with, and mated through the wall to, the vertical exterior posts that run from the side sill to the top chord and reinforce the walls.

[0061] End sheets **48** may be substantially planar slope sheets or slope sheet assemblies that are inclined downwardly in the longitudinally inboard direction to feed the discharge section. Not atypically, each pair of fore-and aft opposed slope sheets may be inclined at equal and opposite angles, and the angles of those sheets may be selected to be somewhat steeper than the free slope angle, or natural talus slope angle of the lading for which the car is designed, such that, when the gates are opened, the lading may tend to flow out, rather than sit at rest.

[0062] The primary structure of body **22** of car **20** includes lading containment vessel **26** which is in the nature of hopper **52**. Hopper **52** has an upper portion **58** with substantially vertical wall panels, and a lower stationary portion defined by a set of converging sloped walls, namely the side and end slope sheet assemblies **48** and **50**. At the lower margin of the sloped walls there is the outflow governor, namely door assembly **56**, which, in this instance, may have the form of a pair of first and second, or left and right hand doors **62**, **64**. This containment structure seats on, and is carried by, a pair of first and second end structures, **66**, **68**, at either end of the car. End structures **66**, **68** are in turn carried by trucks **24**. A door operating apparatus or mechanism, or drive train, or transmission, however it may be termed, and identified generally as **70**, is provided to move doors **62**, **64** between open and closed positions.

[0063] Considering this structure in greater detail, trucks **24** are most immediately surmounted by center plates **72** of longitudinally extending stub sills **44**. Stub sills **44** in turn carry laterally extending main bolster arms **74** of main bolster **90**. Arms **74** extended perpendicularly away from the centerplate **72**, i.e., they are centered on the truck center, **CL - Truck**. Side sills **40** run lengthwise along the car between, and tie together, the most laterally outboard extremities of main bolster arms **74**. A shear plate **76** is mounted in an x-y horizontal plane defining the top cover plate of stub sill **44**. Shear plate **76** extends laterally from side sill to side sill, and longitudinally from the fore-and-aft end slope sheet **48** to the laterally extending end sill **78** of the car, which, in this instance may be an upturned flange formed on the longitudinally outboard margin of shear plate **76**. In car **20**, the primary structure includes an end post **80** and a pair of side or corner posts **82**, **84**.

[0064] End post **80** is rooted in shear plate **76** in line with center sill **44**, and may have lateral webs or gussets aligned with the webs of stub sill **44** to provide vertical web continuity across shear plate **76**. End post **80** then extends fully between shear plate **76** and top chord **86** of end wall **30** or **32**, as may be. Corner posts **82** and **84** are rooted to, and stand upwardly from, the junction of the

laterally outboard ends of left and right hand main bolster arms **74** and side sills **40**. Posts **82** and **84** extend upwardly from this junction to mate with various elements of the end and side walls, as may be described below.

[0065] As described in additional detail below, car **20** has an abnormally short distance from the striker **88** to the truck center, i.e., the **CL** of centerplate **72**. Striker **88** is the vertical planar surrounding face plate at the outboard end of the stub sill **44**. In the terminology of the industry, the portion of the center sill **44** (be it a stub center sill or a straight through center sill) that lies longitudinally outboard of the truck center **CL -Truck** may also be referred to as the draft sill. In car **20**, the short draft sill length, identified as $\mathbf{L_{88}}$, leaves an anomalously small space in which to install other systems, such as the brake reservoir and the door operating pneumatic cylinder. Car **20** has an end of car machinery space, indicated generally as **75**, that is bounded by shear plate **76** on the bottom, the sloped end wall assembly **30** or **32** of the car on the top, main vertical central end post **80**, and main side posts **82**, **84** at the ends of main bolster **90**. This space may be referred to as having the shape, generally, of a triangular prism and is substantially unobstructed by the primary structure of the car. For the purposes of this description, primary structure is defined as the underframe, including side sills and center sill (i.e., including the draft sill), the side walls, the slope sheets and top chords, the hopper construction including the stationary parts of the discharge section, as well as any cross-bearers, cross-ties, bolsters, shear plates and so on. Primary structure excludes secondary or ancillary structure or systems such as ladders, cat-walks and other safety appliances, brakes, brake rods and brake fittings, air hoses, reservoirs and pneumatic fittings, movable door members, door operating linkages, and so on.

[0066] In existing cars, this space, **75**, is often occupied or otherwise obstructed by other primary structure, such as so-called “elephant ears”. In this context, “elephant ears” are large, substantially triangular planar plates, sometimes provided with central lightening holes, that have one edge fixed along the junction of the center sill webs and the center sill cover plate, and another edge welded to the end slope sheet. The third edge is typically a free edge. Often these plates lie in a plane that is oriented at an angle to the vertical – i.e., it leans laterally outboard. Car **20** avoids the use of these “elephant ears” and so provides the large unobstructed space shown in Figure **1b**.

[0067] Figures **1** and **2a**, **2b** and **2c**, all show the sidewall of the car, indicated generally as **34** or **36**. Sidewall **34** and **36** function as short beams of low (e.g., less than 4:1, possibly less than 3:1) length-to-depth ratio. Sidewall **34** or **36** can be seen to have a bottom flange or chord member, namely side sill **40**, a top flange or chord member, namely top chord **38**, which may have the form of a square or rectangular hollow structural steel tube; and an intermediate shear force transfer web,

namely side sheet assembly **42**. Side sheet assembly **42** may include an upper sheet portion or member **92** that is welded to the outside face of top chord **38** at a lap joint, and that extends downwardly therefrom; and a lower sheet portion or member **94**. Member **94** may have the form of a Z-section, having a first portion, namely an upper flange or leg or margin **96** that extends in a substantially vertical plane and has an uppermost margin that overlaps the lowermost edge or margin of member **92**; a second or intermediate portion **98** that runs in an inclined plane sloping inwardly and downwardly on the slope of the hopper side sheets generally, and a third or bottom portion, namely bottom flange, or leg, or margin **100** that extends in a substantially vertical plane downwardly. Sidewall **34** or **36** also includes a central post, or web stiffener, **102** that has a lowermost first portion **104** an intermediate second portion **106**, and an uppermost third portion **108**.

[0068] Side sill **40** includes a channel **110** that is welded toes-inward against the lowermost marginal portion of lower leg **100** to form a closed section. The first or lowermost portion **104** of web stiffener **102** has the form of a quadrilateral gusset having a first edge welded to the upper leg of channel **110**, a second edge welded to the vertical margin **100**, a third edge welded to the sloping portion **98**, and the fourth, laterally outboard, edge being free. As may be noted, portion **104** stands outboard of the sidewall sheet.

[0069] Portion **108** is a rectangular web stiffener that is welded to, and extends downwardly from, the underside of top chord **38** along the inside face of vertical web portion **92**. Intermediate portion **106** is a web, or plate, or gusset, that is also a quadrilateral, having a first edge that overlaps, and is welded to, the lower margin of portion **108**. A second edge is welded to the lower region of vertical web portion **92**, and to the upper flange or leg **96**. A third edge is welded along the sloped portion **98** of member **94**. The fourth edge is free, and faces inwardly into the lading containment space of the hopper. Portions **104** and **106** are co-planar, or substantially co-planar, such that stiffener **102** has web continuity through member **94**. The upper margin of the side slope sheet **50** of the hopper discharge section is welded to the lower margin of the inclined or sloped portion **98**, such that the structure presents a continuous sloped surface for containing, and then slidingly discharging, particulate lading. Expressed differently, the web of the sidewall traverses the sidewall stiffener, commencing on its inboard margin at side sill **40**, traverses the web mid-way up the post, and ends along its outboard margin at top chord **38**. In this arrangement, the vertical stiffener, **102**, acts as the web of a T-section, and the local region of the wall section to which it is joined functions as the flange of that T-section.

[0070] In this example, the locus of intersection of the side slope sheet plane $\mathbf{P_{94}}$ with the plane of the side wall sheet $\mathbf{P_{92}}$, lies above the level of side sill **40** by a substantial distance, indicated

as $\mathbf{L_{94}}$. This distance may lie in the range of ¼ to $^{2}/_{3}$ of the distance $\mathbf{L_{SW}}$ from side sill **40** to top chord **38**, and, in the particular may be about $^{1}/_{3}$ of that distance. Further, although the post has stiffening member web continuity in a vertical plane, the wall sheet traverses the stiffening web intermediate the top chord and the side sill, and does so obliquely on the slope of plane $\mathbf{P_{94}}$.

[0071] The upper leg of channel **110** forms the upper flange of side sill **40**, and the lower leg of channel **110** forms the lower flange of side sill **40**. Shear plate **76** forms the top flange of main bolster **90**. Main bolster **90** also has a lower or bottom flange **91**. In car **20** the upper leg of channel **110** is co-planar or substantially co-planar with, and is connected in flange continuity with, shear plate **76**. Similarly, the lower leg of channel **110** is co-planar or substantially co-planar with, and connected in flange continuity with, bottom flange **91** of main bolster **90**.

[0072] Continuing with the sidewall assembly, the main sheet, namely upper sheet portion **92**, ends at the corners, and there are respective first and second end upper web stiffener portions and inwardly stepped plate members **112**, which may be termed "ears". The top edge of each ear is welded to the inside face of top chord **38** in a lap joint. The longitudinally outboard end edge forms a plane to which the vertical end sheet of the end slope sheet wall abuts and is welded. The bottom edge follows the slope of, and is welded to, end slope sheet **48**. The forward, transversely outwardly bent edge is welded to the upper end portion of side sheet assembly **42**. The lower region of the main sidewall sheet also includes lightening apertures **114**, in the space between the corner posts and the slope of the end slope sheets. Finally, the lower portion of region **100** of the main sidewall sheet has longitudinal extensions **116** that are welded to the side edges of the shear panel, namely shear plate **76**, outboard of main bolster **90**, thereby forming a portion of the peripheral flange of the shear plate.

[0073] End walls **30**, **32** each include upper and lower sloped surface members **122** and **124**, which could be made as a single piece, or as two pieces butt-welded together, as here. Upper member **122** has notches **126** formed therein to accommodate corresponding corner posts **82**, **84** as may be, with local reinforcement doublers **128** at the junction. Lower portion **124** tapers in width to match the narrowing width between the sloped side sheets with which it mates. At the upper end of end wall **30** the end wall assembly includes a laterally extending first formed member **130** that has a first, vertical leg **132** that laps the inside face of the top chord **86**, and a bent flange **136** that extends initially horizontally, with a distal lip bent upward to mate perpendicularly with the upper margin **138** of the end slope sheet **48**. The distal tip of end slope sheet **48** is fillet welded to vertical leg **132**. This results in a substantially triangular closed section defining a laterally extending end slope sheet reinforcement beam **140**. The ends of this beam abut, are welded to, and are capped by elephant ears

112. Vertical leg **132** also lies against, and is welded to, end post **80**.

[0074] A formed angle **142** is mounted toes-in at an intermediate height on sloped end wall **48**, forming thereby another hollow section laterally extending end sheet reinforcement or beam **148**. Vertical leg **144** of angle **142** is substantially aligned with the central web of the corner post (be it **82** or **84**) and therefore also with the central web of the main bolster. Another formed angle **150** is welded toes-in to the back of sloped end wall **30** at the level of shear plate, thereby forming yet another slope-sheet reinforcement in the form of a laterally extending beam.

[0075] The corner posts **82** and **84** each have a lower corner post flange plate **160** (that includes a lifting lug aperture) that has a bottom tab welded to the outside, or back, of the end of side sill **40** in line with the main bolster, then an angled portion following the angle of the outside edge of the vertically extending side wall reinforcements, **161**, to an upper end at the juncture of the side slope sheet with the side wall vertical leg of the lower side wall sheet. Each end post has two internal reinforcements **154**. Each corner post also includes an intermediate member, or web, or gusset, or plate **162**, which is considerably wider than intermediate gusset **106**, and a substantially triangular inside edge web stiffener **164**. Plate **162** is a quadrilateral. A first edge of plate **162** runs along the upward and outward slope of wall extension **166**. A second edge runs vertically against the upper leg of wall extension **166**. A third upper edge adjacent runs horizontally along lateral reinforcement beam **148**. The fourth edge runs vertically downward to and along edge stiffener **164**. As such, a vertical post is established.

[0076] Considering Figures **3a**, **3b** and **3c**, center sill **44** includes a bottom flange or bottom cover plate **165**, and a pair of spaced apart webs **168**. The central region of shear plate **76** forms the top flange, or top cover plate of the center sill. At its inboard end, the center sill terminates centrally under the bottom lateral reinforcement of the end slope sheet **48**. A draft pocket **175** is defined between webs **168**, shear plate **76** and bottom cover plate **165** longitudinally inboard of the striker plate.

[0077] Center plate **72** is mounted at truck center **CL-Truck**, in line with main bolster **90** and the corner posts **82**, **84**. Rear draft stops **172** are welded within the center sill above center plate **72**. As seen in Figure **3c**, the inboard end of rear draft stop **172** extends longitudinally inboard of the truck center. While this is known to have been used in at least one single piece, integrally cast draft sill, the inventor is unaware of such a construction in an all-welded fabrication draft sill assembly. The removable draft sill access cover plate, or draft gear carrier plate **174**, which is bolted to the draft sill (i.e., the stub sill) bottom flange margins, is mounted immediately longitudinally outboard

of center plate **72**. Front draft stops **176** are, in turn, mounted longitudinally outboard of carrier plate **174**. In this embodiment there is also a removable member, such as a top leeway or access plate **178**, mounted to shear plate **76**. Plate **178** is removed when draft gear **180** is removed or installed. On installation, draft gear **180**, to which yoke **188** is already mounted, is fed into draft pocket **175** from below, on an angle, whereby the rear corner protrudes upwardly through the opening that is otherwise covered by plate **178**. The front end of draft gear **180** is rotated into place, and the rear end is rotated downward. As this occurs, yoke **188** is also raised into place. Plates **178** and **174** are then reinstalled. The shank **182** of the coupler, **184** is inserted, and the coupler key **186** is fed through the slot in front draft stops **176** to link coupler **184**, and yoke **188** in the customary manner. It may be noted that coupler **184** combines an AAR Type E shank with and AAR Type F knuckle with a bottom shelf. Draft gear **180** itself has abnormally short travel, namely about 2 ½ inches deflection before going solid, as compared to a "normal" deflection of over 3" before going solid.

[0078] Draft sill webs **164** have, at their longitudinally outboard end an end portion **190** of increased depth of section with a downwardly protruding bulge or horn, such as might be termed a "chin". End portion **190** has an aperture or slot **192** formed therein to permit lateral sliding insertion of a coupler support, carrier or bar **194** immediately behind striker plate **88**. Removal of bar **194** permits yoke **188** to be swung into place during installation of draft gear **180**. When coupler **184** is installed, the shank may rest on bar **194**. Bar **194** is held in place by bolts that secure it relative to webs **164**. Overall, a coupler installation of very short length is achieved. In this example, $\mathbf{L_{88}}$ may be in the range of less than 50 inches, and in one embodiment may be about 38" +/- 2", from the truck center to the outboard face of striker plate **88**. An alternative expression of the relative compactness of the draft gear is that the length from the truck center to the pulling face of the coupler, when the draft gear is extended in tension, is in the range of less than 65 inches, and in one embodiment is in the range of 53" +/- 2".

[0079] Car **20** may also include a door opening mechanism **200**. There are left and right hand, or first and second, doors **62**, **64**. Each door has a proximal, hinged edge **206**, and a distal free edge **208**. The hinges are carried on hinge fittings welded to mounting brackets depending from the slope sheets and side sills. The hinges run parallel to the longitudinal or lengthwise axis of the car, generally such that doors **62**, **64** are longitudinal doors. Each door has the form of a hollow section beam, having a proximal beam **210** along the hinge side, a distal beam **212** along the free edge, internal cross-braces, not shown, and front and back skins or sheets or plates **214**, **216**. The hinges are indicated as **220**, the end closure plates as **222**, **224**. The doors have door seal members **226**, **228** that mutually engage when the doors are moved to a closed position. Seal members **226**, **228** are sprung, such that when they are closed they deflect somewhat and in so doing take on a spring pre-

load against each other. The door mechanism includes a pair of first and second, matched left and right hand pivot arms **230**, **232**; a corresponding pair of first and second drag links **234**, **236**; a shared yoke **238**, and a pair of slave links **240**, **242** that each pick up on a knuckle fitting **244**, **246** of each of respective doors **62**, **64**. The whole assembly has left and right hand symmetry.

[0080] Inasmuch as, when tripped, doors **62**, **64** open under the influence of gravity, particularly when assisted by the weight of the lading being discharged, one may consider the motion that occurs as the doors are closed in the sequence of views **4a**, **4b**, and **4c**; **5a**, **5b**, and **5c**; and **6a**, **6b** and **6c**. Knuckles **244** and **246** are constrained by geometry to move in circular arcs of fixed radii in planes perpendicular to the respective axes of rotation of doors **62** and **64**, those axes being the hinge axes of their respective hinges **220**, which each lie in a plane parallel to the **x**-**z** plane of the car centerline. The plane of rotation of knuckles **244**, **246** will then tend to be perpendicular to the central **x**-**z** plane. Slave links **240** and **242** are each of fixed length; each has an end pivotally connected at a two rotational degree of freedom knuckle, be it **244** or **246**, as may be; each of slave links **240** and **242** has another end pivotally connected at a second pivot connection at yoke **238**; and slave links **240** and **242** do not transmit a bending moment, and so therefore pull in pure tension. The upper, or near (i.e., proximal), ends of drag links **234**, **236** are connected to the distal ends of pivot arms **230**, **232** at pivot connections **248**, **250**, which may, if desired, share a common axis of rotation or pivot pin.

[0081] Yoke **238** is constrained by symmetry to pull in an **x**-**z** plane, which in the embodiment illustrated is the vertical plane of the centerline of the car. As such, movement of yoke **238** away from the plane of motion of knuckles **244** and **246** will necessarily draw knuckle fittings **244** and **246** closer together, and toward the vertical centerline plane of the car, eventually causing resilient door seals **226**, **228** mutually to engage, thus closing the opening. This motion can be achieved by pulling on drag links **234**, **236**. Each pivot connection of slave links **240**, **242** has a single angular degree of freedom. Similarly yoke **238** has an angular degree of freedom about the axis of rotation of the axle, or trunnions, by which it is pivotally mounted to the drag link, or drag links **234**, **236**. This gives the drag link connection two angular degrees of freedom in total. As the drag links are withdrawn, the slave links pull in tension, finding the natural hypotenuse between the plane of the arc of motion of knuckle fittings **244**, **246** and the plane of motion of drag links **234**, **236**. Since this mechanism operates in tension, pivot connections **248**, **250** and knuckle fittings **244**, **246** are co-planar, with drag links **234**, **236**, yoke **238**, slave links **240** and **242**, and their associated pivot connections also lying in that same plane as well. (See Figures **5a**, **5b**, **5c**).

[0082] Driving force for this system is provided by an actuator, identified as **260**. Actuator

260 may be a pneumatic actuator, which may be charged by the pneumatic system of the train generally, as supplied through the pressurized air connection of the train line. Actuator **260** may include its own reservoir and check valve. Actuator **260** is connected to move a first member, in the nature of a primary driven pivot arm or lever, **262**, which is in this instance actually a pair of matched lever arm members, which in turn is pivotally connected to, and drives, a second member in the nature of, a push rod, or, given the symmetrical nature of the assembly, a pair of left and right hand push rods **264** and **266**. One or both of push rods **264**, **266** may have a secondary member, such as may be an extending arm, or detent, or stop, or abutment, identified as an over-center travel limiter or governor, **268**. The far ends of push rods **264**, **266** may be connected to either pivot arms **230** (or **232**, as may be), or to drag link **234** (or **236**, as may be). It may be convenient to connect the far end of push rods **264**, **266** at the same pivot connection, or connections **248**, **250**.

[0083] Lever **262** has a first end pivotally mounted to primary structure of car **20** at footings, identified as mounting fixtures, fittings or brackets **270**. The drive rod of actuator **260** picks up on lever **262** at an intermediate location, such that lever **262** provides magnification of displacement. Similarly, pivot arms **230**, **232** have a first or base end pivotally connected to primary structure at mounting fixtures, fittings, or brackets **272**. Actuator **260** is located on the centerline (i.e., in the central x-z plane) of car **20**, between and in substance below pivot arms **230**, **232**. "Below" in this context may be thought of as radially more proximate to the pivot axis $\mathbf{P_{270}}$ of brackets **270** than is the pivot axis of connections **248**, **250**, as well as in the context of being lower than as in closer to Top of Rail. In the past the lever fitting has more commonly been mounted to the slope sheet such that the output pin is lower than the pneumatic cylinder. Turning this arrangement upside down, in effect, and fitting the cylinder may then permit a more compact installation than otherwise. Similarly, the pivot axis, $\mathbf{P_{230}}$, of driven arms **230**, **232** is below the output knuckle, i.e., at $\mathbf{P_{250}}$, and is below the actuator cylinder as shown in Figure **5b** in which $\mathbf{P_{250}}$ lies below the center line $\mathbf{CL_{260}}$ or actuator **260**. This may be taken in the sense of being further from the plane of the end slope sheets, identified as $\mathbf{P_{48}}$. Expressed differently, actuator **260** lies between the base or datum pivot point $\mathbf{P_{250}}$ of driven arms **230**, **232** and the plane $\mathbf{P_{48}}$ of end slope sheet **48**.

[0084] As may be noted, the line of action of drag links **234**, **236** has a predominant component that is substantially parallel to plane $\mathbf{P_{48}}$. Expressed differently, at some point during mid–stroke, the line of action will be at least instantaneously parallel to plane $\mathbf{P_{48}}$. Finally, it may be noted that rather than placing actuator **260** on shear plate **76**, and orienting actuator **260** such that its longitudinal axis (i.e., the working axis or axis of reciprocation of the actuator), that actuator is itself raised upwardly from the shear plate and oriented to work along a line of action that is tilted downward and longitudinally inboard, the angle of tilt being identified as $\boldsymbol{\alpha_{260}}$. This angle of

inclination lies in the range from horizontal to the angle of inclination of end slope sheet **48**, identified in Figure **5c** as α_{48}. Placing the mounts and pivot points under the apparatus, raising the actuator cylinder, orienting it on an incline, and making the line of action or the zone swept by the draglinks in the progressions of Figures **4a**, **4b** and **4c** (or **5a**, **5b** and **5c**) tend to correspond to a displacement substantially or predominantly parallel to plane $\mathbf{P_{48}}$, all aid in providing a more compact installation, in particular one that is longitudinally short as may suit the short distance from the truck center to the striker. It is also an installation that may tend to leave space for other car systems, such as the brake system.

[0085] This arrangement may be thought of in terms of a four bar, or multi-bar, linkage. The first bar of the linkage may be thought of as being the underframe, and structure rigidly mounted to the underframe. This is the datum, or frame of reference member of the linkage. The second member or linkage component is the first pivot arm, **230** (or **232**) having a fixed main pivot point, and an output distal pivot point constrained to move on a fixed radius about main pivot point $\mathbf{P_{230}}$. The fourth component or element of the linkage is the second pivot arm, namely **62** or **64**, each of which is a second lever or pivot arm mounted to a pivot axis fixed with respect to the first or datum link, and having a distal connection, in this case also a pivot connection, constrained to move in an arc of constant radius about the base pivot axis. The third linkage is the drag link. Although the drag link is made of two portions that are held together at yoke **238**, the geometric symmetry of the assembly constrains both the upper portion of the drag link, (i.e., drag link **234**, **236**) and the lower portions, (i.e., slave links **240**, **242**) to be co-planar during closing of the doors. In any case, the single input of the actuator cylinder acting through the over-center links against the first pivot arm (at the distal pivot connection) produces a unique output geometry such that position of the elements is determinate as if it were a four bar linkage.

[0086] When the door opening apparatus is retracted to the position shown in Figures **4c**, **5c** and **6c**, driven primary pivot arms and the over-center links are driven to a slightly over-center relationship such that the pivot connection between the primary pivot arms and the over center arms lies below a line drawn from the primary pivot axis and the over-center link output connection as axis $\mathbf{P_{250}}$. In this condition tensile force on drag links **234** and **236** (as from weight placed on doors **62**, **64**, for example) will tend to urge the main driven pivot arms, namely lever **262**, counter-clockwise as viewed in Figure **4c**. Motion in this direction is prevented by the over center stop, **268**, thereby defining a first lock that prevents inadvertent opening of doors **62**, **64** from moving to the open position when actuator **260** is dormant, i.e., inactive. This first lock is released by reversing actuator **260** to open the doors.

[0087] Car **20** has a secondary door mechanism, or secondary latching system, identified generally as **300**. This secondary latch system, and, indeed, the door closure linkage apparatus of Figures **7a** – **7e**, are slightly different from those shown in Figures **4a**, **5a**, and **6a**. In latching system **300** there is a latch assembly **302**, shown in Figures **7a** and **7b**. Assembly **302** includes a first member, or main member, or plate **304**, which performs the function of a body or armature or spider that ties the other various physical elements of the assembly together. Along one edge plate **304** has physical motion constraint fittings, identified as hinge fittings **306**, that limit plate **304** (and assembly **302** more generally) to a single degree of freedom, that single degree of freedom limiting plate **304** to motion of any point to motion in a plane perpendicular to the hinge axis, and in particular to pivotal motion in that plane about that axis. To the extent that the hinge axis is substantially or predominantly parallel to the axis of reciprocation of pneumatic actuator **260**, that motion can be said to be sideways, or predominantly transverse of cross-wise to that direction of reciprocation.

[0088] Plate **304** has a portion or finger, or arm member **308** extending away from the hinge. In this case, arm member **308** extends arcuately away, and has a bent termination, or end, or lip, or tip, indicated at **310**. Another member **312** in the form of a block is mounted, e.g., welded, at the distal end of arm member **308**. Member **312** has the same general shape, a dog-leg bend, as tip **310**. Member **312** has a first, generally inwardly (i.e., away from the tip) facing surface **314** that defines an abutment **316**. Member **312** also has an oblique surface **318** that defines a wear or cam surface, which may be termed a reset cam, or return cam.

[0089] Another member **320**, which may have the form of a plate or block, is welded to the major portion of the body of plate **304** relatively close to the hinge axis. The axially foremost face of member **322** is relieved – i.e., it does not define a face in a plane perpendicular to the hinge axis – or to the axis of reciprocation of the pneumatic actuator clevis. This face may be arcuate or chamfered, and so defines a first or deflection cam **324**. That is, as installed, it lies in the path of actuator clevis **330**. When the leading corner of clevis **330** encounters cam **324**, plate **304** will tend to be urged to rotate, i.e., pivot, about its axis in the clockwise direction as viewed looking from actuator **260** toward hopper **52**. Assembly **302** also includes a motion resisting, or return biasing member in the form of a spring, identified as leaf spring **326** that is anchored at the proximal end to stationary structure of the secondary lock footing, or base, **328** which is welded to shear plate **76**. The footprint of base **328** against shear plate **76** is planar. The hinge axis is inclined relative to the plane as shown, the angle of inclination being substantially similar to, and possibly the same as, the mid-stroke angle of inclination of actuator **260** (which, itself, varies slightly during operation). The distal end of spring **326** bears against plate **304** distant from the hinge. Finally, assembly **302**

includes reaction force transmission members **332**, **334** in the form of welded flat bars that bear against, i.e., abut, the longitudinally outboard face of mounting fitting **270** when the latch is in the engaged position.

[0090] In operation, as actuator **260** works, lost motion is taken up in slot **336** of the distal or forward end **338** of the reciprocating actuator ram. Eventually the end of slot **336** engages a pivot pin **340** of bell crank arm **342** and causes driven member **344** (analogous to driven member **262**), causing it to rotate counterclockwise as viewed in Figure **7a**. This forces push rods **346**, **348** (analogous to push rods **264**, **266**) to act against connections **248**, **250**, and hence to force drag links **234**, **236** along their retracting path. Since **262**, **264**, **230** and the car body form a four bar linkage, the output path of connections **248**, **250** is determinate and unique.

[0091] While this happens, clevis **338** keeps moving rearward to engage reset cam surface **318**, with the effect that assembly **302** is urged to rotate out of the way, against the resistance of spring **326** (Figure **7d**). Eventually the trailing portion of clevis **338** clears cam **324**, and soon thereafter the most longitudinally inboard edge of driven member **344** clears abutment **316**. Assembly **302** then moves under the influence of spring **326** into the locked position shown in Figure **7e**. In this locked position, any moment tending to pivot driven member **344** clockwise is reacted not by the hinge fittings, but rather by the reinforcements, namely members **332**, **334**. In this locked position driven member **344** and push rods **346**, **348** are drawn to, and locked in, their over center position.

[0092] When the doors are to be released, actuator **260** moves in the opposite direction. The lost motion of the length of slot **336** reverses, such that the end of clevis **338** bears against the release cam, namely cam surface **324**, which causes plate **304** to pivot away, and thus disengages abutment **316**, moving it out of the path of driven member **262** against which it would otherwise abut. The outboard end of slot **336** then engages pin **340**, releasing the over-center hold of driven member **344**, and permitting the doors to open under the influence of gravity.

[0093] The cams need not necessarily be on the plate, i.e., the latch body, but could be on the clevis, as shown at **350** in Figure **4c**. That is, it is to some extent arbitrary which part is identified as the cam, and which part is identified as the cam follower. The point is that the parts mutually engage such that the one intercepts the other during motion of the actuator cylinder to trip the door opening condition, with the result that the secondary latch is urged to deflect out of the way sideways. In the other direction, of course, the abutment relationship of items **262** and **316** prevents the doors from opening. The apparatus of Figure **4c** works in substantially the same way, and combines both arms

of the bell crank driven member **344** into a single driven lever, namely lever **262**.

[0094] In summary, car **20** has a first lock, the over center lock, operable to prevent movement of the door from the closed position to the open position when the door actuator is inactive. Car **20** also has a second lock, symbolized by latching system **300**, operable to prevent movement of the door from the closed position to the open position when the door actuator is inactive if the first lock should fail. The second lock is movable between an engaged position in which it prevents movement of the door to the open position thereof. In moving between the engaged and disengaged positions, the second lock has a displacement that is predominantly cross-wise to the first direction of the reciprocation of the door actuator. Actuator **260** is positioned to reciprocate in the central lengthwise-vertical plane of car **20**. Latching system **300** is movable predominantly transverse to the central lengthwise-vertical plane as it pivots in a circumferential direction between the engaged and disengaged positions. The hinge axis lies parallel to the lengthwise vertical plane, and the second lock pivots circumferentially. The second lock is biased toward the engaged position. The lock mechanism can be thought of as having a first fitting, a second fitting and a third fitting. The first fitting is the mounting, **238** by which to connect the lock mechanism to the datum structure. The second fitting is one of a cam or a cam follower for co-operation with a member of the door actuating transmission. The third fitting is the abutment, i.e., **316**, that co-operates with a mating part of the door actuating transmission, in this case the side of lever **262**. The third fitting is movable between a first position and a second position, in the first position the abutment being presented to obstruct motion of the mating fitting of the door actuating transmission and thereby to prevent the door from moving to an open position thereof. The second fitting is movable between a first position and a second position, in the first position thereof the second fitting being positioned to intercept the member of the door actuating transmission and to be deflected away from the first position toward the second position thereby. The first fitting has a first degree of freedom of motion permitting the first and second fittings to move between their respective first and second positions. The degree of freedom constrains the third fitting to motion predominantly cross-wise to the axial direction. The bias member is a spring having a first end and a second end, the first end being mounted to bear against the body of the lock mechanism, the second end having a foot for reaction against the datum structure, namely shear plate **76**. The first degree of freedom of motion is an angular degree of freedom, and is predominantly cross-wise circumferential motion. The axis of rotation is the hinge axis, which is substantially parallel to the axial direction of the door actuating transmission.

[0095] Various embodiments have been described in detail. Since changes in and or additions to the above-described examples may be made without departing from the nature, spirit or scope of the invention, the invention is not to be limited to those details.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/816,660	06/16/2010	James W. Forbes	200405.00139	3873

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EXAMINER	
SMITH, JASON C	
ART UNIT	PAPER NUMBER
3617	

NOTIFICATION DATE	DELIVERY MODE
11/30/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patents@hahnlaw.com
akron-docket@hotmail.com

Office Action Summary	Application No.	Applicant(s)	
	12/816,660	FORBES ET AL.	
	Examiner	Art Unit	
	Jason C. Smith	3617	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 June 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-42* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8, 11-15,23,24,27-32,41 and 42* is/are rejected.

7)☒ Claim(s) *9,10,16-22,25,26 and 33-40* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 June 2010* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been filed in parent Application No. 12/559065, filed on 09/14/2009.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 9-10, and 24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Regarding claims 9 and 10, it is unclear how the shear plate (76) defines the upper flange (96) that is connected to the side walls, since the shear plate is above the draft sill. Also, the shear plate is not co-planar with the upper flange as stated in claim 10.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 2, 23, and 24 are rejected under 35 U.S.C. 102(b) as being anticipated by Smith (4,348,962). Smith discloses a railroad hopper car for carrying particulate material, said hopper car comprising: a hopper; first and second end sections for carriage by respective first and second railroad car trucks for rolling motion along railroad tracks in a longitudinal direction; said hopper being suspended between said first and second end sections, said hopper having a discharge section through which to release lading, and first and second end slope sheets (34) oriented toward said first and second end sections, said end slope sheets being inclined in the longitudinal direction to feed said discharge section; said first end section including a draft sill (58) extending in the longitudinal direction, a main bolster (14) extending cross-wise to said draft sill, and a shear plate (50) mounted to said draft sill and to said main bolster, said shear plate extending lengthwise along said draft sill and cross-wise from side to side of said hopper car; said first end slope sheet of said hopper overhanging said shear plate of said first end section (see figure 5(; and said hopper car being free of primary structure directly above said shear plate of said first end section under said overhang of said first end slope sheet of said hopper (see figure 5); [claim 2] an end post (106) is disclosed as well as a slope sheet with an upper margin terminating at an end wall with the end post extending upwardly (see figure 1); [claim 23] side sills (35) are disclosed in figures 1 and 2; [claim 24] see figure 8.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Smith (4,348,962) in view of O'Hara (4,484,527). Smith discloses the hopper car set forth above, but does not disclose a striker. However, O'Hara does disclose a striker (14). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to provide a striker disclosed in Smith in view of the teaching of O'Hara. The motivation for doing so would have been to provide reinforcement for the draft still.

8. Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith (4,348,962) in view of Gramse (4,246,849). Smith discloses the hopper car set forth above, but does not disclose a corner posts. However, Gramse does disclose a corner posts as shown in figure 1. Figure 1 shows 2 middle endposts and 2 corner posts. These type of posts could be used in place of the posts used in Smith. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to provide posts disclosed in Smith in view of the teaching of Gramse. The motivation for doing so would have been to provide reinforcement for hopper car.

9. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Smith (4,348,962) in view of O'Hara (4,484,527) in view of Gramse (4,246,849). Smith discloses the hopper car set forth above, but does not disclose a machinery space.

However, Gramse does disclose a machinery space as shown in figure 1. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to provide a machinery space disclosed in Smith in view of the teaching of Gramse. The motivation for doing so would have been to provide a space for equipment.

10. Claims 7, 8, and 27-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith (4,348,962) in view of O'Hara (4,484,527) in view of Gramse (4,246,849) in view of Stark et al. (4,224,877). Smith discloses the hopper car set forth above, but does not disclose an actuator or brake reservoir partially lodged in the space. However, Stark does disclose machinery partially lodged in the machinery space (see figure 1). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to provide equipment partially lodged in the machinery space disclosed in Smith in view of the teaching of Stark. The motivation for doing so would have been to provide a space that has easy access to the equipment; [claim 29] see figure 1 of Gramse; [claim 30] see figure 1 of Gramse.

11. Claims 11-15, 31, and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith (4,348,962) in view of Tomaka (4,800,820). Smith discloses the hopper car set forth above, but does not disclose a hollow laterally extending beam between first and second side walls. However, Tomaka does disclose a laterally extending beam (41) as shown in figure 1. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to provide a hollow beam disclosed in Smith in view of the teaching of Tomaka. The motivation for doing so would have been to provide reinforcement, but in using a hollow beam the car would also be lighter;

[claim 12] the beam has first and second edge mounted along the slope sheet with a third portion mounted across said shear plate as shown in figure 1. [claims 13 and 14] the toes connect to the slope sheet and the back is mounted to the shear plate via the slope sheet; [claim 15] At the time of the invention, it would have been obvious to a person of ordinary skill in the art to provide an angle iron mounted toes in disclosed in Smith in view of the teaching of Tomaka. The motivation for doing so would have been to provide a better connection for the reinforcement; [claim 32] see figures.

12. Claims 41 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith (4,348,962) in view of Tomaka (4,800,820) in view of Gramse (4,246,849). Smith discloses the hopper car set forth above, but does not disclose an opening in board of the corner post upward of the shear plate, and leeward of the slope sheet. However, Gramse does disclose an opening in board of the corner post upward of the shear plate, and leeward of the slope sheet (see figure 1). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to provide an opening in board of the corner post upward of the shear plate, and leeward of the slope sheet disclosed in Smith in view of the teaching of Gramse. The motivation for doing so would have been to provide a space for the machinery; [claim 42] It would have been an obvious matter of design choice to have a length from the truck center to the striker plate less than 50 inches, since such a modification would have involved a mere change in the size of a component. A change in size is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237 (CCPA 1955). Further, changes in size or shape without special functional significance are not patentable.

Research Corp.v. Nasco Industries, Inc., 501 F2d 358; 182 USPQ 449 (CA 7) cert. Denied 184 USPQ 193; 43 USLW 3359 (1974). The motivation for doing so would have been based on the design criterion of the gondola car being manufactured.

Allowable Subject Matter

13. Claims 9, 10, 16-22, 25, 26, and 33-40 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

14. Claims 9, 10, and 24 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason C. Smith whose telephone number is (571) 270-5225. The examiner can normally be reached on M- F, 7:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Morano can be reached on (571) 272-6684. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/S. Joseph Morano/
Supervisory Patent Examiner, Art Unit 3617

/Jason C Smith/
Examiner, Art Unit 3617

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re: Patent Application of: Confirmation No.: 3873

Title:	Railroad Gondola Car Structure and Mechanism Therefor
Inventor:	James W. Forbes et al.
Assignee:	National Steel Car Ltd.
Filed:	June 16, 2010
Serial No:	12/816,660
Art Unit:	3617
Examiner:	Smith, Jason C.

To: Mail Stop Amendment
The Honorable Commissioner of Patents and Trademarks
P.O. Box 1450
Alexandria, VA 22313-1450

RESPONSE TO OFFICE ACTION

Sir:

This letter is responsive to the Official Action dated November 30, 2010, and is timely filed to meet the due date of February 28, 2011. Please amend the above-identified application as follows:

Amendments to the Specification – None at this time.

Amendments to the Claims begin on page 2 of this paper.

Amendments to the Drawings – None at this time.

Remarks begin on page 12 of this paper.

Please charge any additional fees or fee deficiency required by this paper to Deposit Account 15-0450.

Amendments to the Claims

The following listing of claims supersedes all previous listings of claims in this matter.

1. (Original) A railroad hopper car for carrying particulate material, said hopper car comprising:

a hopper;

first and second end sections for carriage by respective first and second rail road car trucks for rolling motion along railroad tracks in a longitudinal direction;

said hopper being suspended between said first and second end sections, said hopper having a discharge section through which to release lading, and first and second end slope sheets oriented toward said first and second end sections, said end slope sheets being inclined in the longitudinal direction to feed said discharge section;

said first end section including a draft sill extending in the longitudinal direction, a main bolster extending cross-wise to said draft sill, and a shear plate mounted to said draft sill and to said main bolster, said shear plate extending lengthwise along said draft sill and cross-wise from side to side of said hopper car;

said first end slope sheet of said hopper over hanging said shear plate of said first end section; and

said hopper car being free of primary structure directly above said shear plate of said first end section under said overhang of said first end slope sheet of said hopper.

2. (Original) The railroad hopper car of claim 1 wherein one of:

(a) said first end slope sheet has an upper margin and said hopper car includes an end post extending upwardly from said draft sill to said slope sheet upper margin; and

(b) said first end slope sheet has an upper margin terminating at an end wall, and said hopper car includes an end post extending upwardly from draft stub sill to said end wall.

3. (Original) The railroad hopper car of claim 2 wherein said shear plate has a longitudinally outboard margin and said draft sill has a striker located outboard of said longitudinally outboard margin of said shear plate, and said end post is one of:

(a) rooted to said draft sill adjacent to said striker;

(b) rooted to said shear plate adjacent to said longitudinally outboard margin of said shear plate.

4. (Original) The railroad hopper car of claim 1 wherein said bolster has first and second laterally outboard distal ends, and said hopper car has corner posts extending upwardly from said distal ends of said hopper to said first end slope sheet.

5. (Original) The railroad hopper car of claim 2 wherein said bolster has first and second laterally outboard distal ends, and said hopper car has corner posts extending upwardly from said distal ends of said hopper to said first end slope sheet.

6. (Original) The railroad hopper car of claim 1 wherein:

one of:

(a) said first end slope sheet has an upper margin and said hopper car includes an end post extending upwardly from said draft sill to said upper margin of said first end slope sheet; and

(b) said first end slope sheet has an upper margin terminating at an end wall, and said hopper car includes an end post extending upwardly from draft stub sill to said end wall;

said shear plate has a longitudinally outboard margin and said draft sill has a striker located outboard of said longitudinally outboard margin of said shear plate, and said end post is one of:

(a) rooted to said draft sill adjacent to said striker;

(b) rooted to said shear plate adjacent to said longitudinally outboard margin of said shear plate;

said bolster has first and second laterally outboard distal ends, and said hopper car has corner posts extending upwardly from said distal ends of said hopper to said first end slope sheet; and

said hopper car has a machinery space bounded by (a) said first end slope sheet; (b) said shear plate of said first end section; (c) said end post; and (d) said corner posts, and said machinery space is free of any other primary structure.

7. (Original) The railroad hopper car of claim 6 wherein:

said hopper car has at least one longitudinally hinged discharge door, said discharge door being movable cross-wise between open and closed positions; and

a longitudinally acting pneumatic actuator is at least partially lodged in said machinery space directly above said draft sill.

8. (Original) The railroad hopper car of claim 7 wherein a brake reservoir is also at least partially lodged in said machinery space.

9. (Currently amended) The railroad hopper car of claim 1 wherein:

said shear plate is mounted above, and to, said main bolster and defines an upper flange thereof;

said main bolster has a lower flange downwardly spaced from said upper flange, said lower flange terminating at respective distal end portions at either side of said car;

said car includes a side sill running along said car between said first and second end sections;

said side sill has an upper flange, said upper flange of said side sill being substantially co-planar with, and connected to, said shear plate; and

said side sill has a lower flange, said lower flange of said side sill being substantially co-planar with a respective one of said distal end portions of said lower flange of said main bolster.

10. (Original) The railroad hopper car of claim 9 wherein said shear plate defines an upper flange of said draft sill whereby said draft sill upper flange, said shear plate and said side sill upper flange are all substantially co-planar.

11. (Original) A railroad hopper car, said hopper car comprising:

a hopper;

first and second end sections for carriage by respective first and second rail road car trucks for rolling motion along railroad tracks in a longitudinal direction;

said hopper being suspended between said first and second end sections, said hopper having a discharge section through which to release lading, and a first end slope sheet oriented toward said first end section, said first end slope sheet being inclined in the longitudinal direction to feed said discharge section;

said first end section including a draft sill extending in the longitudinal direction, a main bolster extending cross-wise to said draft sill, and a shear plate mounted to said draft sill and to said main bolster, said shear plate extending lengthwise along said draft sill and cross-wise from side to side of said hopper car;

said first end slope sheet of said hopper over-hanging said shear plate of said first end section;

first and second side walls running lengthwise along first and second sides of said car, said first end slope sheet of said hopper extending cross-wise between said first and second side walls;

a first laterally extending reinforcement mounted cross-wise to said first end slope sheet adjacent to said shear plate;

said shear plate of said first end section being connected to said first laterally extending reinforcement;

said first end slope sheet of said first end section being connected to said first laterally extending reinforcement;

said first laterally extending reinforcement defining part of a first hollow section beam extending across said hopper car between said first and second side walls.

12. (Original) The railroad hopper car of claim 11 wherein said laterally extending reinforcement member includes a first edge mounted cross-wise along said first end slope sheet; a second edge mounted cross-wise along said first end slope sheet and spaced from said first edge, and a third portion mounted across said shear plate of said first end section.

13. (Original) The railroad hopper car of claim 11 wherein said laterally extending member has a pair of first and second spaced apart toes, and said laterally extending member is mounted toes-in against said first end slope sheet, whereby said first hollow section beam is defined by said laterally extending reinforcement and said first end slope sheet.

14. (Original) The railroad hopper car of claim 11 wherein said laterally extending reinforcement has, when seen in section, a first toe, a second toe, and a back; said laterally extending reinforcement is mounted toes-in against said first end slope sheet; and said back is mounted to said shear plate of said first end section.

15. (Original) The railroad hopper car of claim 14 wherein said laterally extending reinforcement is an angle iron mounted toes-in to said first end slope sheet.

16. (Original) The railroad hopper car of claim 11 wherein:

said hopper car has a first end wall member running cross-wise between said first and second side walls;

said first end slope sheet has an upper margin that meets said first end wall member at a first junction;

said first end wall member extends upwardly from said first junction;

said first end wall member has a lower portion extending downward of said first junction;

said lower portion of said first end wall member and said upper margin of said first end slope sheet co-operate to define portions of the cross-section of a second hollow section beam extending cross-wise across said hopper car between said first and second side walls.

17. (Original) The railroad hopper car of claim 16 wherein said lower portion of said first end wall member has a lower margin that is bent to meet said upper margin of said first end slope sheet at a location lower than said first junction.

18. (Original) The railroad hopper car of claim 16 wherein said first end wall member has an upper margin that terminates at a top chord, said top chord extending from side to side of said hopper car.

19. (Original) The railroad hopper car of claim 16 wherein said car includes an upstanding end post, said end post being mounted over said draft sill longitudinally outboard of said main bolster and extending upwardly therefrom to meet said first end wall member.

20. (Original) The railroad hopper car of claim 16 wherein an intermediate beam extends across said first end slope sheet between said first and second side walls at a position intermediate said first hollow section beam and said second hollow section beam.

21. (Original) The railroad hopper car of claim 20 wherein said intermediate beam includes a cross-wise extending structural member mounted toes-in against said first end slope sheet to define a closed hollow section.

22. (Original) The railroad hopper car of claim 16 wherein said first and second side walls of said hopper car define sidewalls of said hopper, and said first and second side walls include end portions that are stepped laterally inboard, and said second hollow section beam extends between said end portions of said first and second side walls that are stepped laterally inboard.

23. (Original) The railroad hopper car of claim 11 wherein said railroad hopper car includes first and second side sills extending between said respective main bolsters of said first and second end sections of said hopper car, said first and second side walls extend upwardly from said first and second side sills.

24. (Original) The railroad hopper car of claim 23 wherein said first and second side sills have upper

flanges at the level of said shear plate of said first end section, and said main bolster of said first end section and said side sills have respective lower flanges, the lower flange of said main bolster mating with the lower flanges of said side sills.

25. (Original) The railroad hopper car of claim 11 wherein:

said hopper car has second, and third hollow section beams as well as said first hollow section beam, said first, second and third hollow section beams extending thereacross between said first and second side walls thereof;

said first end slope sheet has an uppermost margin, and said second hollow section beam runs along said uppermost margin of said first end slope sheet;

said third hollow section beam is located intermediate said first and second hollow section beams;

said hopper car has an end post mounted over said draft sill, said end post being located longitudinally outboard of said main bolster of said first end section;

said end post extends upwardly to meet said second hollow section beam;

said hopper car has first and second side sills running longitudinally along either side thereof, said first and second side walls extending upwardly of said first and second side sills respectively;

said first and second side sills mate with first and second ends of said main bolster of said first end section; and

said first and second side sills have upper flanges that mate with said shear plate of said first and section.

26. (Original) The railroad hopper car of claim 25 wherein:

there is an end wall that extends from sidewall to sidewall;

said end wall has an upper portion that has an upper margin terminating at a top chord of said end wall;

said first end slope sheet has an uppermost margin, said uppermost margin of said first end slope sheet meeting said end wall along a first juncture;

said end wall has a lower portion extending below said first juncture, said lower portion being bent to define a portion of said second hollow section beam; and

said end post extends past said second hollow section beam along said end wall to mate with said top chord of said end wall.

27. (Original) The railroad hopper car of claim 11 wherein:

said main bolster of said first end section of said railroad hopper car has first and second

ends at laterally outboard extremities thereof;

said hopper car has first and second corner posts mounted at said first and second ends of said main bolster of said first end section, said corner posts extending upwardly from said main bolster to said first end slope sheet;

said draft sill has a longitudinally outboard end;

an end post stands upwardly of said longitudinally outboard end of said draft sill;

a machinery space is defined above said shear plate, below said first end slope sheet, longitudinally inboard of said end post, and between said corner posts; and

said machinery space is free of any other primary structure.

28. (Original) The railroad hopper car of claim 27 wherein:

said hopper has a movable door by which egress of lading is governed;

said hopper car has an actuator and a drive train, said drive train being connected between said actuator and said door, said actuator being operable to move said door; and

said actuator is mounted in said machinery space.

29. (Original) The railroad hopper car of claim 28 wherein said first side wall has an aperture formed therein at a location higher than said shear plate, lower than said first end slope sheet, and longitudinally inboard of said first corner post.

30. (Original) The railroad hopper car of claim 11 wherein:

said main bolster of said first end section has first and second ends;

said car has first and second corner posts extending upwardly from said first and second ends of said bolster respectively; and

said first and second side walls of said car have openings defined therein longitudinally inboard of said respective corner posts, above said shear plate, and below said first end slope sheet.

31. (Original) A railroad hopper car, said hopper car comprising:

a hopper;

first and second end sections for carriage by respective first and second rail road car trucks for rolling motion along railroad tracks in a longitudinal direction;

said hopper being suspended between said first and second end sections, said hopper having a discharge section through which to release lading, and a first end slope sheet oriented toward said first end section, said first end slope sheet being inclined in the longitudinal direction to feed said discharge section;

said first end section including a draft sill extending in the longitudinal direction, a main bolster extending cross-wise to said draft sill, and a shear plate overlying said draft sill and said main bolster, said shear plate extending along said draft sill and cross-wise from side to side of said hopper car;

said first end slope sheet over-hanging said shear plate of said first end section;

first and second side walls running lengthwise along first and second sides of said car, said first end slope sheet of said hopper extending cross-wise between, said first and second side walls;

there being a first end wall extending between said first and second side walls;

said first end slope sheet having an uppermost margin, said uppermost margin meeting said first end wall at a first junction;

said hopper car having a first beam extending cross-wise between said first and second side walls at said first junction of said uppermost margin of said first end slope sheet and said first end wall, said first beam being a beam of hollow section.

32. (Original) The railroad hopper car of claim 31 wherein:

said first end wall has an upper portion and a lower portion;

said upper potion of said first end wall extends upwardly of said first junction of said uppermost margin of said first end slope sheet and said first end wall;

said lower portion of said end wall extends downwardly of said first junction of said uppermost margin of said first end slope sheet and said first end wall; and

said lower portion of said first end wall forms part of said first beam.

33. (Original) The railroad hopper car of claim 32 wherein said lower portion of said first end wall has a margin, and said margin is bent to mate with said first end slope sheet as a second junction distant from the first junction, said lower portion of said first end wall and said uppermost margin of said first end slope sheet co-operating to define said first beam.

34. (Original) The railroad hopper car of claim 33 wherein an end post is mounted over said draft sill outboard of said main bolster, said end post extending upwardly to meet said first beam.

35. (Original) The railroad hopper car of claim 34 wherein:

said upper portion of said first end wall extends upwardly of said first junction to end at a top chord; said top chord extends across said hopper car between said first and second side walls; and

said end post extends past said first beam to terminate at said top chord.

36. (Original) The railroad hopper car of claim 33 wherein a second beam is mounted across said first end slope sheet adjacent said shear plate.

37. (Original) The railroad hopper car of claim 36 wherein a third beam is mounted across said first end slope sheet intermediate said first and second beams, and said third beam is formed of a structural member mounted toes-in against said first end slope sheet to define an hollow section.

38. (Original) The railroad hopper car of claim 34 wherein:

said main bolster has first and second ends; and

respective first and second corner posts are mounted to said first and second ends of said main bolster and extend upwardly therefrom.

39. (Original) The railroad hopper car of claim 38 wherein:

a machinery space is defined above said shear plate, in the lee of said first end slope sheet, longitudinally inboard of said end post and between said first and second corner posts; and

said machinery space is free of any other primary structure.

40. (Original) The railroad hopper car of claim 39 wherein:

said first side wall has an aperture formed therein in a location that is longitudinally inboard of said first corner post, above said shear plate, and leeward of said first end slope sheet;

said hopper has a movable gate operable to govern egress of lading from said hopper;

there is an actuator mounted in said machinery space, and a drive train connecting said actuator to said gate.

41. (Original) The railroad hopper car of claim 31 wherein:

said main bolster has first and second ends; and

respective first and second corner posts are mounted to said first and second ends of said main bolster and extend upwardly therefrom;

said first side wall has an opening formed therein, said opening being located longitudinally inboard of said first corner post, upward of said shear plate, leeward of said first end slope sheet.

42. (Original) The railroad hopper car of claim 31 wherein:

a truck center is defined at the intersection of said main bolster and said draft sill;

said draft sill has a longitudinally outboard end, and a striker plate mounted at said longitudinally outboard end; and

said draft sill has a length between said truck center and said striker plate that is less than 50 inches.

Remarks

1. Status of the Case

Claims 1 – 42 were pending in this case.

Claims 1, 2, 23 and possibly 24 were rejected as being anticipated under 35 USC 102(b) by US P 4,348,962 of Smith;

Claim 3 was rejected as being obvious under 35 USC 103(a) given US P 4,484,527 of O'Hara in light of Smith;

Claims 4 and 5 were rejected as being obvious under 35 USC 103(a) given US P 4,246,849 of Gramse in view of Smith;

Claim 6 was rejected as being obvious under 35 USC 103(a) given Gramse in view of O'Hara and Smith;

Claims 7, 8, 27 – 30, 41 and 42 were rejected as being obvious under 35 USC 103(a) given US P 4,224,877 of Stark in view of Smith, O'Hara, and Gramse;

Claims 11 – 15, 31, 32, 41 and 42 were rejected as being obvious under 35 USC 103(a) given US P 4,800,820 of Tomaka given Smith; and

Claims 9, 10 and 12 were rejected on the basis of formalities under 35 USC 112.

Claims 9, 10, 16 – 22, 25, 26 and 33 – 40, and possibly claim 24, were indicated as being allowable if re-written in independent form (and if amended to overcome any rejection under 35 USC 112, as might be).

2. Preliminary Matter: Unclear Disposition of Claim 24

The Office Action indicates at page 3 that claim 24 is rejected under 35 USC 102.

The Office Action also indicates at page 14 that claim 24 would be allowable if re-written in independent form.

These two statements appear to be mutually contradictory. The Applicant would therefore appreciate clarification. In the event that claim 24 is rejected, the Applicant respectfully requests a full and fair non-'Final' opportunity to address the rejection.

3. 35 USC 112 – Claims 9, 10 and 24s

The Office Action suggests that the language of claims 9, 10 and 24 is unclear:

"… it is unclear how the shear plate (76) defines the upper flange (96) that is connected to the side walls since the shear plate is above the draft sill. Also the shear plate is not co-planar with the upper flange as stated in claim 10."

It appears there may have been some misunderstanding. Upper flange **96** forms no part of any of claims 9, 10, or 24. Upper flange **96** is part of the sidewall of the car, namely the upper margin of the kinked, lower portion of the sidewall that angles inwardly and downwardly.

The upper flange to which claim 9 refers is the upper flange of the main bolster. The main bolster is identified as **90** in Figure **3a**. It is also shown in Figure **3b**, although not annotated. The bottom flange of the main bolster is indicated in Figure **3a** as **91**. Main bolster **90** also includes a vertical web that runs upwardly from bottom flange **91**. This vertical web has an upper margin that runs underneath, and is welded to the underside of, shear plate **76**. Thus, as indicated in paragraph [0071] shear plate **76** defines the upper flange of main bolster **90**. Again, this can also be seen in Figure **3b**. This corresponds to the claim language:

"said shear plate is mounted above, and to, said main bolster and defines an upper flange thereof."

The antecedent noun to the preposition "thereof" is "bolster", i.e., the shear plate defines the upper flange of the main bolster. The shear plate, **76**, is indeed co-planar with the upper flange of the side sill as also indicated in paragraph [0071].

Note that the Applicant has amended claim 9 to include additional punctuation and to improve readability. The amendments are not intended to change the meaning of the sentence.

4. 35 USC 102 and 35 USC 102 – US P 4,348,962 Smith

The Applicant again suspects that there may have been a misunderstanding.

Claim 1

Claim 1 is directed toward a car that has an unobstructed machinery space above the shear plate. The specification notes the issue at paragraph [0007], and gives a rather more expansive description at paragraphs [0065] and [0066]. Of particular note, paragraph [0065] indicates that the machinery space is free of primary structure, and paragraph [0066] explains that "primary structure" includes "elephant ears" and then goes on to explain what "elephant ears" are. The description

explicitly explains that "Car **20** avoids the use of these "elephant ears" and so provides a large unobstructed space shown in Figure **1b**."

With that in mind, one may note the concluding sub-phrase of claim 1:

"said hopper car being free of primary structure directly above said shear plate of said first end section under said overhang of said first end slope sheet of said hopper."

Smith notes the conventional use of elephant ears, which he refers to in column 1 as "diagonal end struts or gussets" in US Patents 3,339,499; 3,490,387; and 3,844,229. He explains his own system of gussets (i.e., elephant ears) which he then claims in every one of his independent claims. The Applicant respectfully submits that a person of ordinary skill, on a fair reading, would readily infer that Smith's "plurality of vertical gusset plates" (i.e., items **106**) where thought by Smith to be an integral and essential part of his invention.

An examination of Smith Figures **1** and **8** would similarly reveal that gussets **106**, being primary structure, rather obstruct the machinery space in question. The Applicant respectfully submits, therefore, that not only does Smith have primary structure (i.e., gussets **106**) mounted directly above the shear plate and under the overhang, thus obstructing the space, but, further, he teaches them as being desirable; and further still, claims them. Therefore, not only does Smith not have the features of claim 1, he teaches away from them.

For this reason, the applicant respectfully submits that no rejection under either 35 USC 102 or 35 USC 103 can be made against claim 1, or any claim dependent therefrom, namely claims 2 – 10, on the basis of the Smith reference. The Applicant therefore respectfully requests the reconsideration and withdrawal of the rejection of claims 1 – 8, and the allowance of those claims

Claims 11 -15, and 27 - 30

Claim 11 indicates that there is, *inter alia*, a laterally extending reinforcement that defines a hollow section beam that extends across the hopper car between the first and second sidewalls. The first end slope sheet is connected to the laterally extending reinforcement, and the laterally extending reinforcement is mounted cross-wise to the first end slope sheet adjacent to the shear plate.

The Office Action acknowledges that Smith does not have the lateral reinforcement, but suggests that it would be obvious to use the lateral reinforcement, **41**, of Tomaka for the desired purpose, merely moving it to the correct location.

The Applicant respectfully disagrees. In order to establish *prima facie* grounds for rejection of a claim it is still necessary to show where each of the features of the claim is found in the prior art or other objective evidence of record. Claim 11 is not for a hollow section beam that is located just anywhere. Claim 11 requires that the reinforcement beam be located adjacent to the shear plate. Neither Smith, nor Tomaka, nor both Smith and Tomaka taken together, has, or have, the recited features of the claim. The lack of that feature, alone is sufficient to show that *prima facie* grounds for rejection of claim 11 have not been established.

In addition to lacking the claimed feature, the Supreme Court in *Graham* v. *John Deere* pointed out that the key to making a rejection under 35 USC 103(a) is the articulation of a clear reason for making the proposed combination or modification. There is nothing in either Smith or Tomaka that points to any reason for making this placement.

This is not surprising, given that both Smith and Tomaka have huge elephant ear structures supporting the end slope sheet. Smith apparently doesn't need such a cross-beam at all, and Tomaka doesn't need it down low because of the angling of items **35** and **36**. *I.e.*, in Tomaka there is no significant unsupported span down low, whereas there is a greater unsupported span width higher up. By contrast, a car in which there is no primary structure over the shear plate might very well have a significant unsupported lateral span. However neither Smith or Tomaka makes any such teaching, and the presence of the primary structure they do have (Smith items **106**; Tomaka items **35** and **36**) rather teaches away from what would otherwise apparently be redundant structure.

In respect of claims 12, 14 and 15, neither Smith nor Tomaka has the claimed feature of the reinforcement being mounted to the shear plate. Again, this isn't a matter of arbitrary placement. It is an explicit feature of the claims that is missing from the cited art. Being mounted in this way means that the shear plate and the slope sheet are tied together, and tied together by a structure that yields a rather stiff hollow section beam. Neither Smith nor Tomaka shows, describes, or suggests this feature. Again, lacking an explicitly claimed feature, *prima facie* grounds for rejection cannot be established under 35 USC 103(a).

The Applicant respectfully requests reconsideration and withdrawal of the rejection of claim 11 and of all claims dependent therefrom not already indicated as allowable.

Claims 23 and 24 – 35 USC 102(b)

Claims 23 and 24 depend from claim 11.

Oddly, the Office Action purports to reject claims 23 and 24 under 35 USC 102(b) as being anticipated by Smith, whereas the Office Action itself acknowledges that Smith does not have the lateral hollow section beam of claim 11. If so, then a rejection under 35 USC 102(b) can neither be established on the basis of Smith in respect of claim 11, nor in respect of dependent claims 23 and 24. The Applicant respectfully requests reconsideration and withdrawal of the rejection, and allowance of the claim, or, alternatively, clarification of the rejection and a full and fair, non-'Final' opportunity to address any revised rejection.

Claims 31, 32, 41 and 42

Claim 31 requires that the end slope sheet meet an end wall at a junction, and that at the junction there be an hollow section beam. The rejection under 35 USC 103 is based on Smith and Tomaka. Smith has such a junction, but has no such lateral reinforcement. Tomaka has a lateral reinforcement, but no such junction. There is no reason to put Tomaka's reinforcement in Smith's car because Smith has three big supports, in the form of members **106** and their respective flanges **114**, that already break up this span and support that structure. The junction of the end wall and the slope sheet acts as an angle iron beam. The resistance of a beam to deflection varies as the cube of the unsupported span length. When the span is broken into four parts, as shown in Smith Figures **1** and **8**, the need for any reinforcement is reduced accordingly. As noted above, these big vertical stiffening panels appear to be essential features of Smith's invention.

Railroad cars are highly utilitarian mechanical structures. They do not, generally speaking, add structural elements arbitrarily as a matter of, say, fashion design. There is no reason articulated in the Office Action to explain why Smith's structure would ever need, or benefit from, what would then seem to be a redundant reinforcement such as Tomaka's at the junction of the two panels. What purpose would such a reinforcement then serve given Smith's items **106** and **114**? The Office Action provides no answer to this question. Yet without a plausible answer to that question there is no reason to make the combination and modification proposed in the Office Action.

5. Concluding Commentary

The Applicant respectfully submits that all of the claims pending in the case should now be in a condition for allowance. The Applicant therefore requests the reconsideration and withdrawal of all of the rejections made in the case, and the allowance of the claims.

The Applicant therefore requests early and favorable disposition of this matter.

Date February 28, 2011

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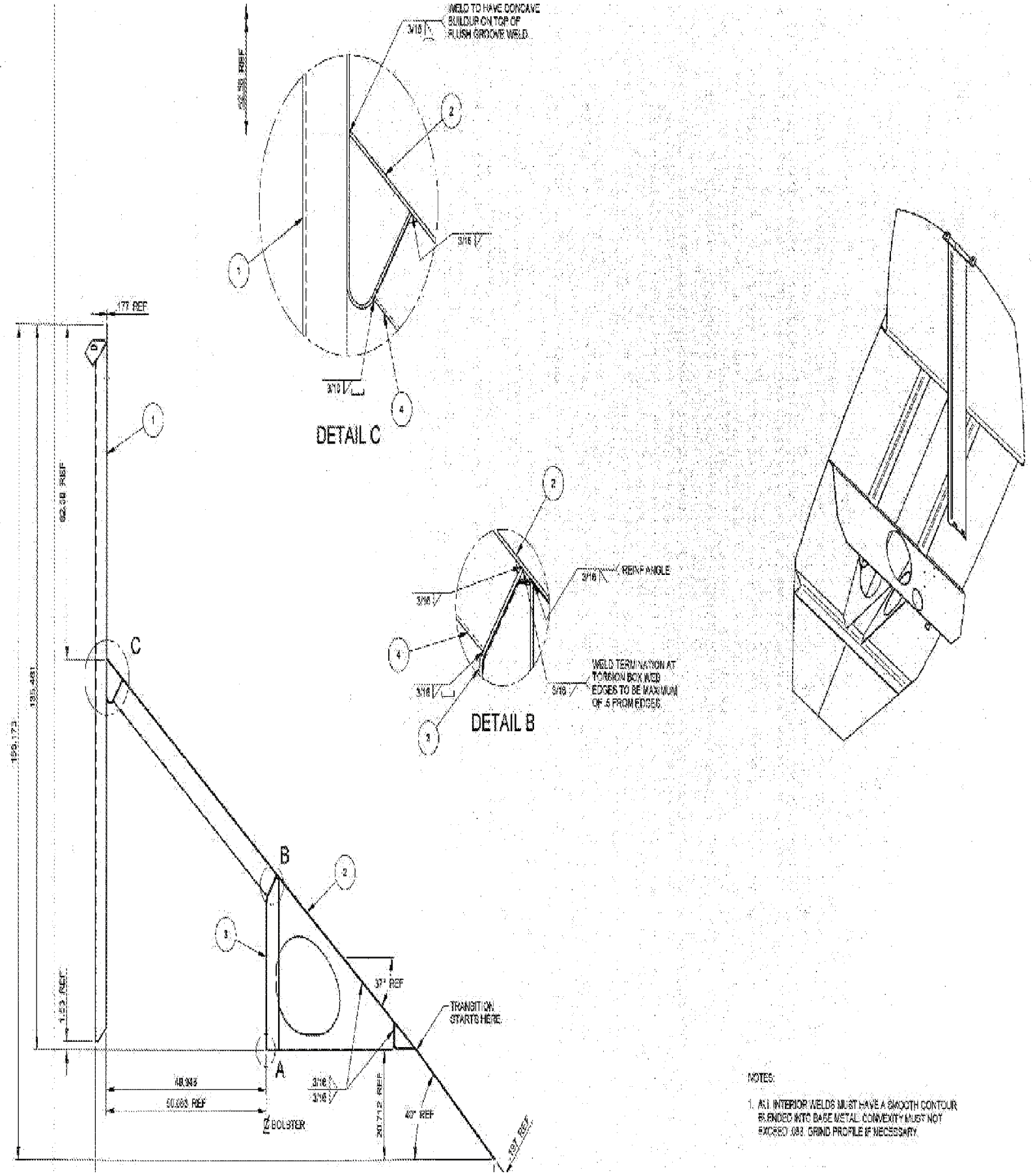
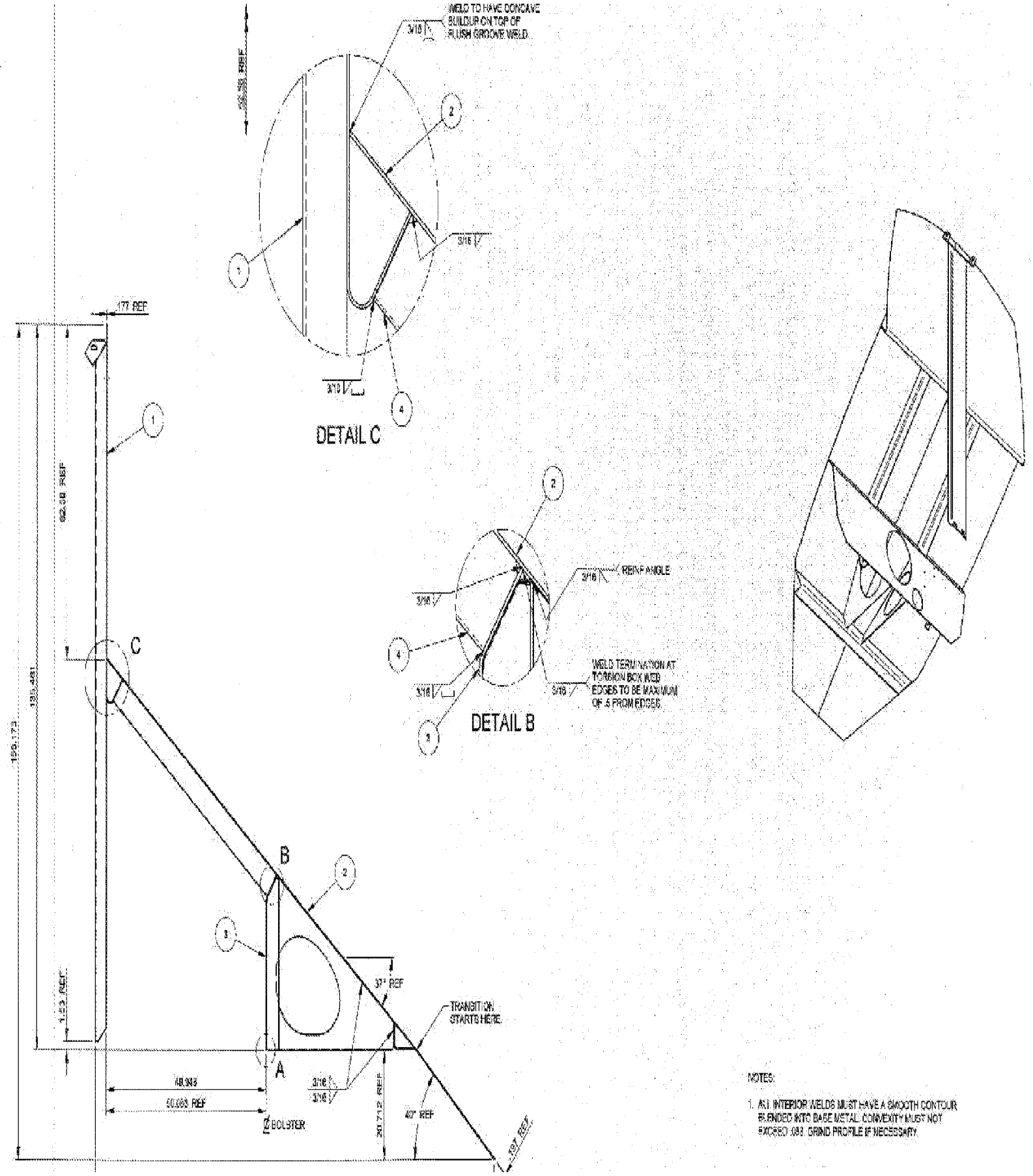


NOTES:

1. ALL INTERIOR WELDS MUST HAVE A SMOOTH CONTOUR BLENDED INTO BASE METAL. CONVEXITY MUST NOT EXCEED .093. GRIND PROFILE IF NECESSARY.



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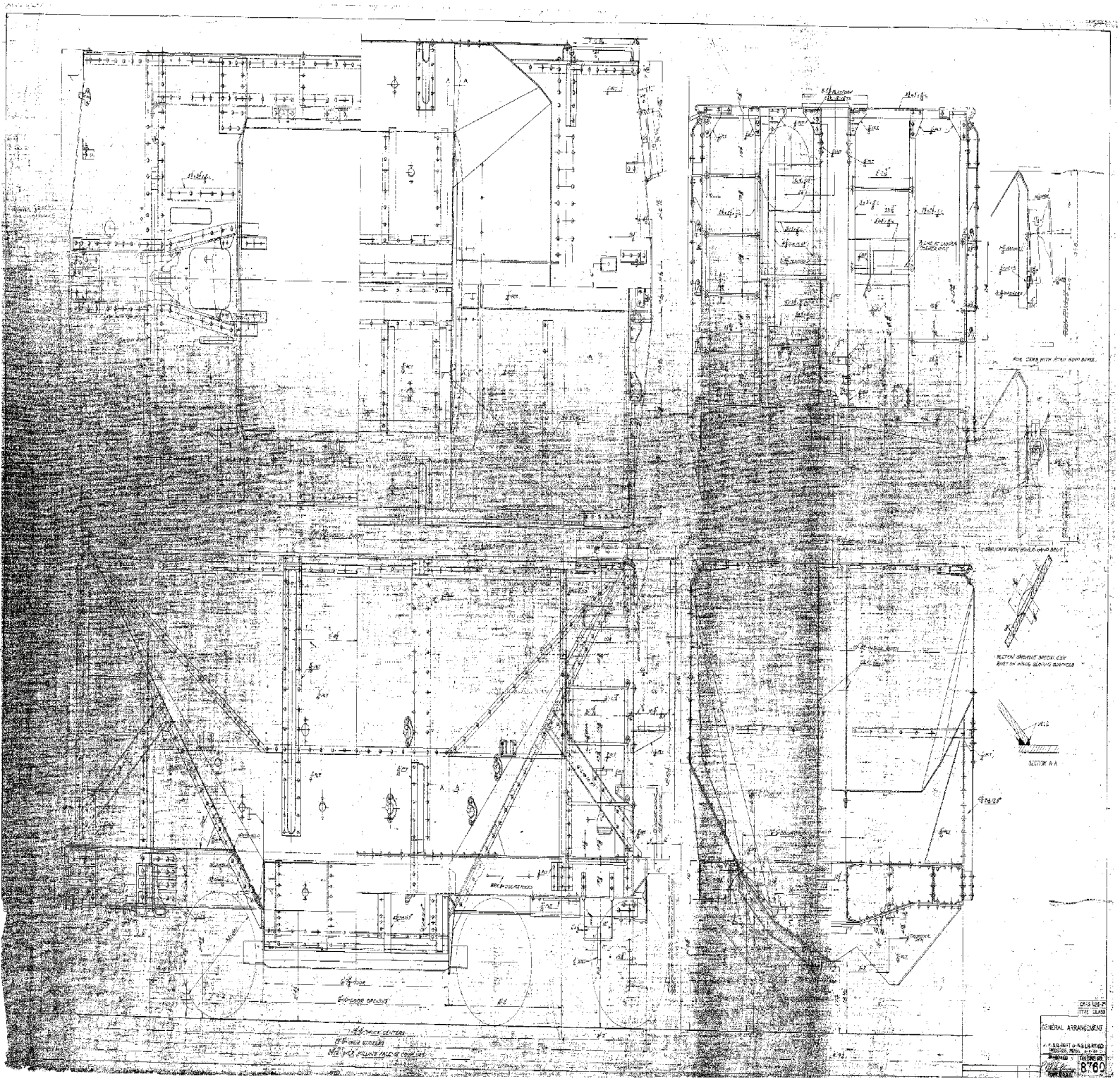
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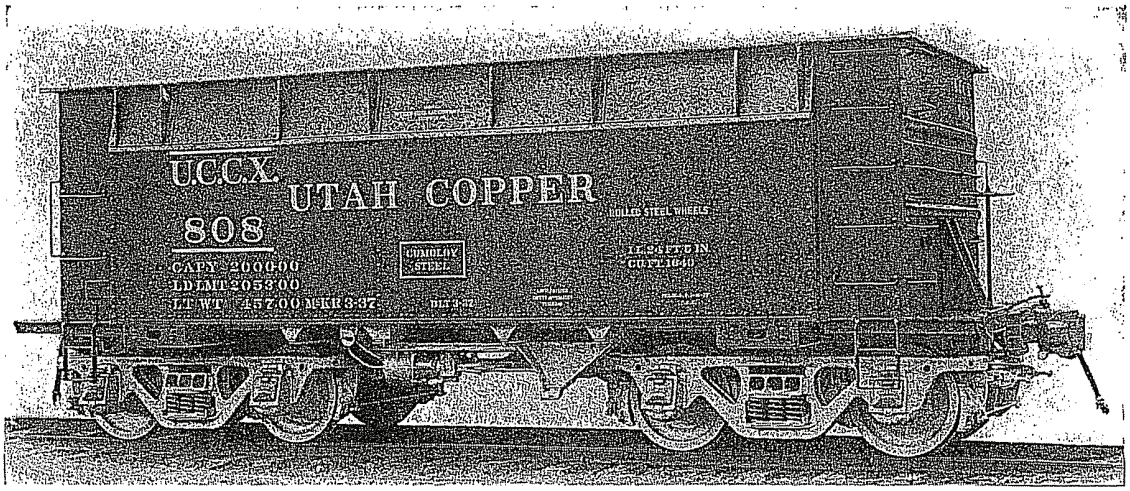

Fig. 404—Utah Copper Company 200,000-lb. Capacity High-Tensile Steel Ore Car. Light Weight 45,700 lb. Inside, Length 24 ft. 5 in.; Width 10 ft. 6 in.; Height 6 ft. 6¾ in. Builder, Pressed Steel Car Company, Inc.

Fig. 405—Union Pacific (O.-W. R. R. & N.) 70-Ton Ore Car, A. A. R. Class GA. Weight 62,300 lb.; Load Limit 147,700 lb.; Capacity 1360 cu. ft.; Inside Length 28 ft. 0 in.; Inside Width 9 ft. 6 in. Builder, St. Louis Car Company

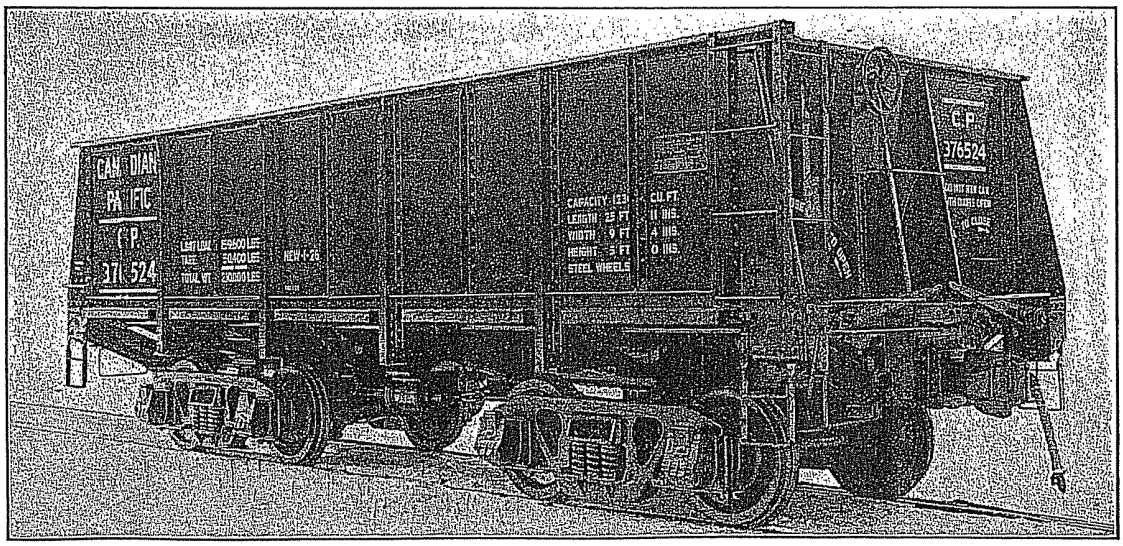

Fig. 406—Canadian Pacific 75-Ton All-Steel Ore Car with Five Drop Bottom Doors, Each Side, A. A. R. Class GA. Weight, 50,400 lb.; Load Limit, 159,600 lb.; Capacity, 1,230 cu. ft.; Length Inside, 25 ft. 11 in.

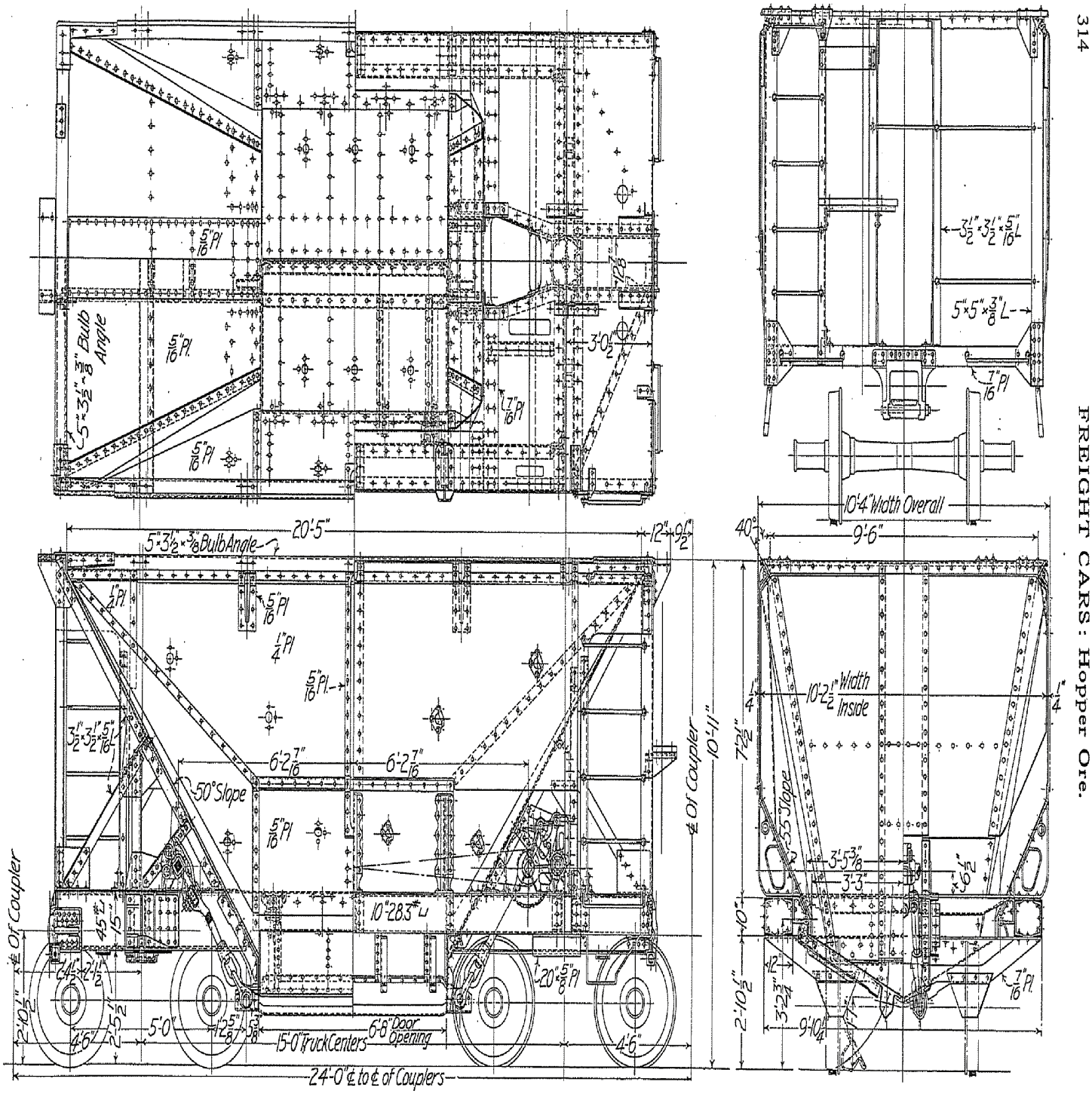

Fig. 407—90-Ton All-Steel 6½ in. by 12 in. Axle Load Enterprise Hopper Ore Car, Center Discharge. Cubic Capacity, 1121 cu. ft. Level or 1325 cu. ft. with 12 in. Average Heap.

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Enterprise Railway Equipment Company.

- (*See also Page 301*)

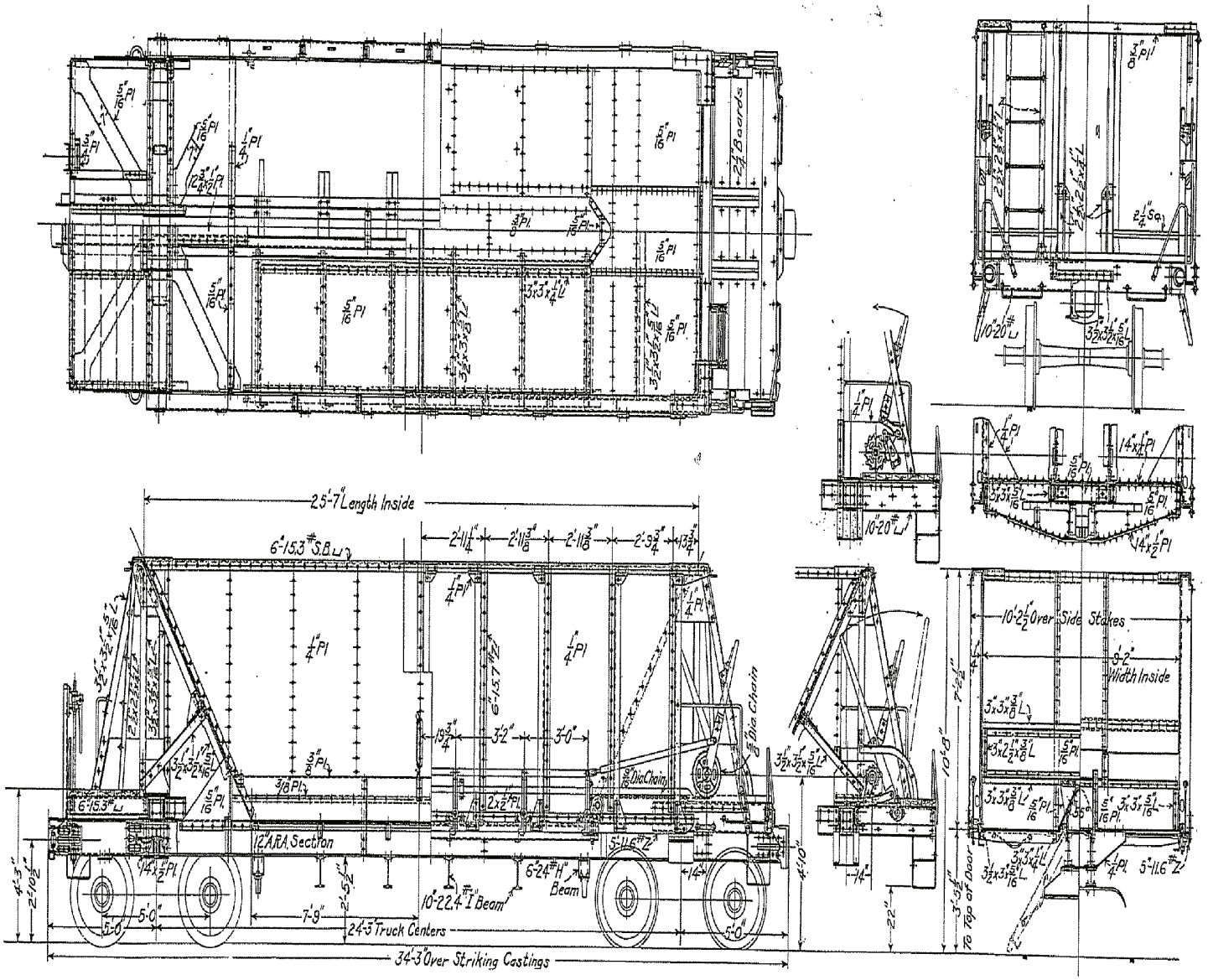

Fig. 408—80-Ton All-Steel 6 in. by 11 in. Axle Load Ingoldsby-Enterprise Ore Car, Side Discharge for Copper Mining. Cubic Capacity, 1335 cu. ft. Level or 1570 cu. ft. with 12 in. Average Heap.

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(See also Page 301)

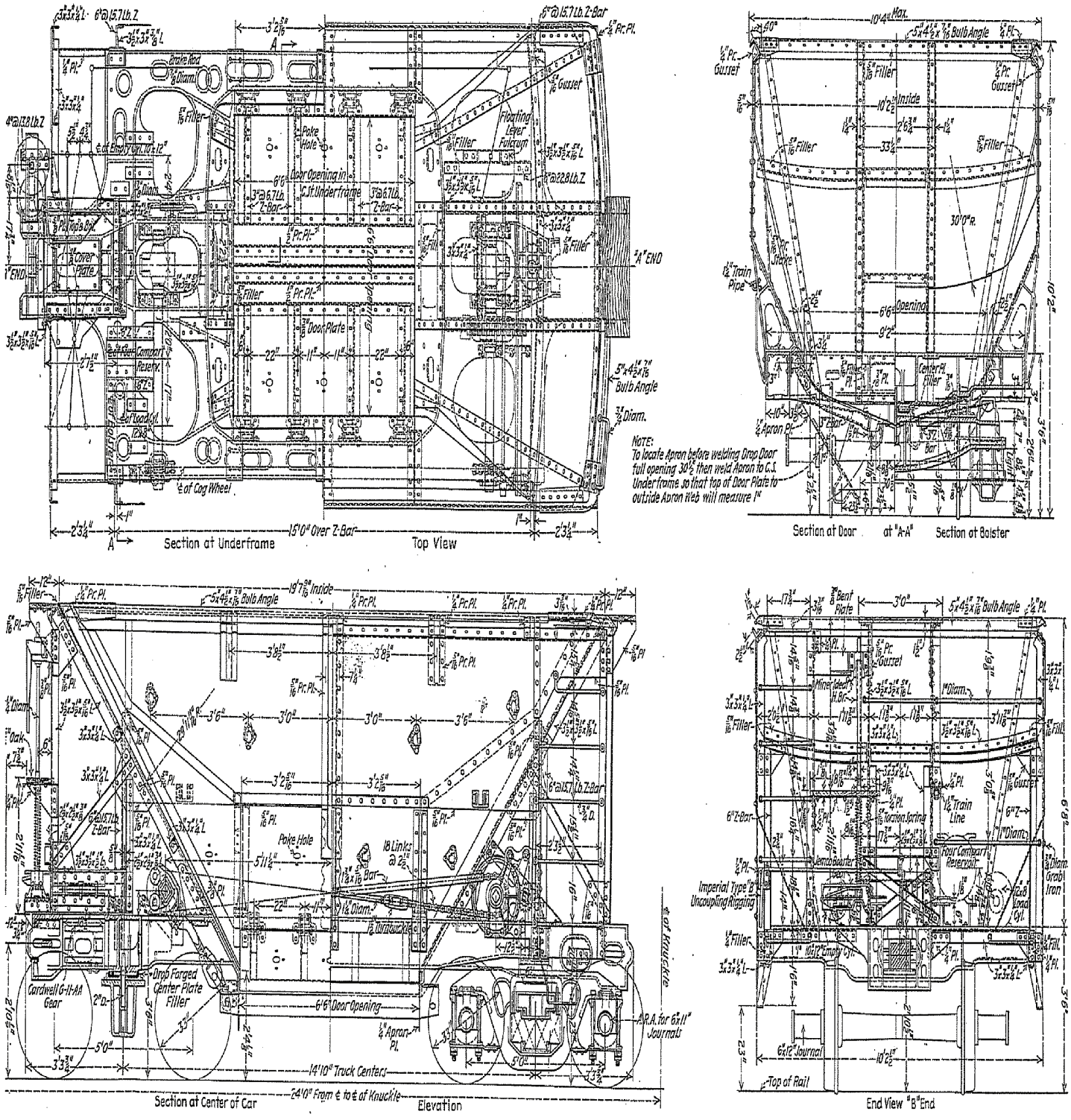

Fig. 409—Plan, Elevation and Sections of Duluth, Missabe & Northern 96-Ton Capacity Hopper Ore Car with Commonwealth Cast Steel Underframe.

(See also Fig. 410)

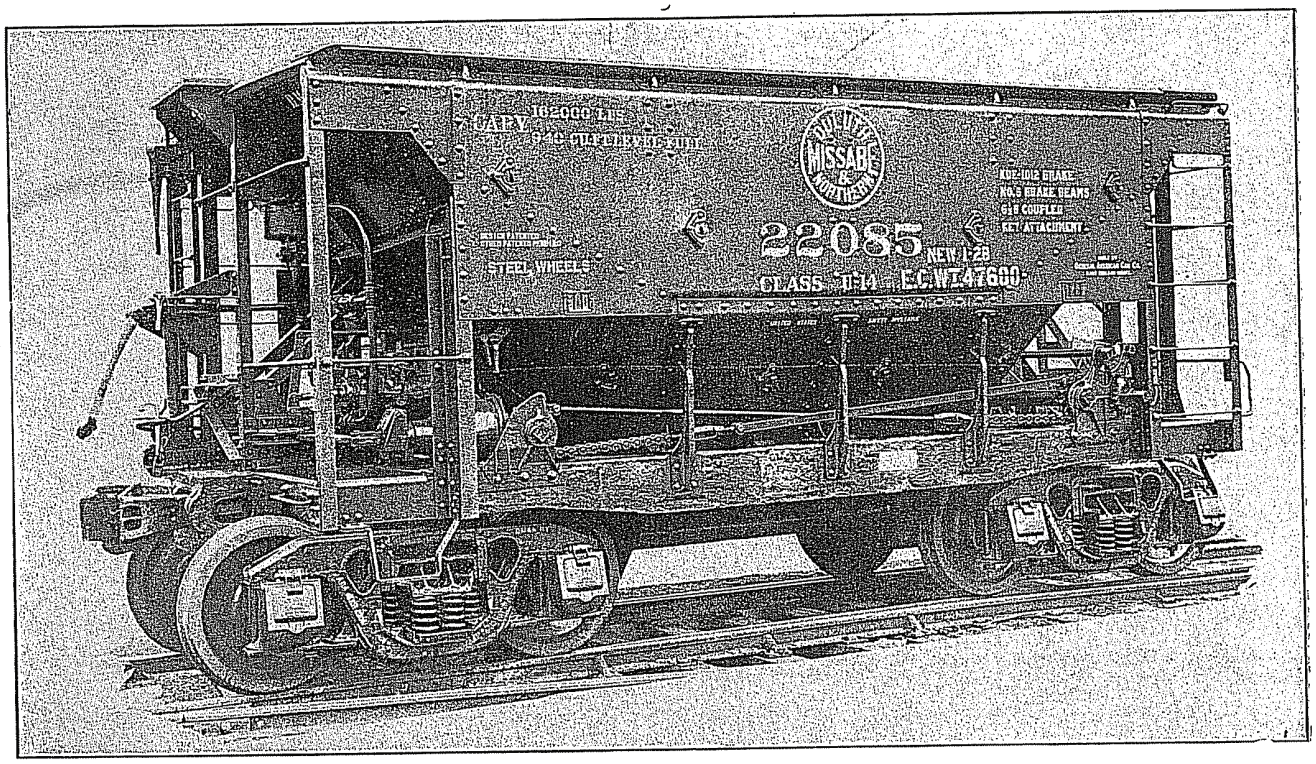

Fig. 410—Duluth, Missabe & Northern 96-Ton Capacity, Hopper Ore Car, Road Class U14, With Commonwealth Cast Steel Underframe. Builder, General American Car Company.
(See also Fig. 409)

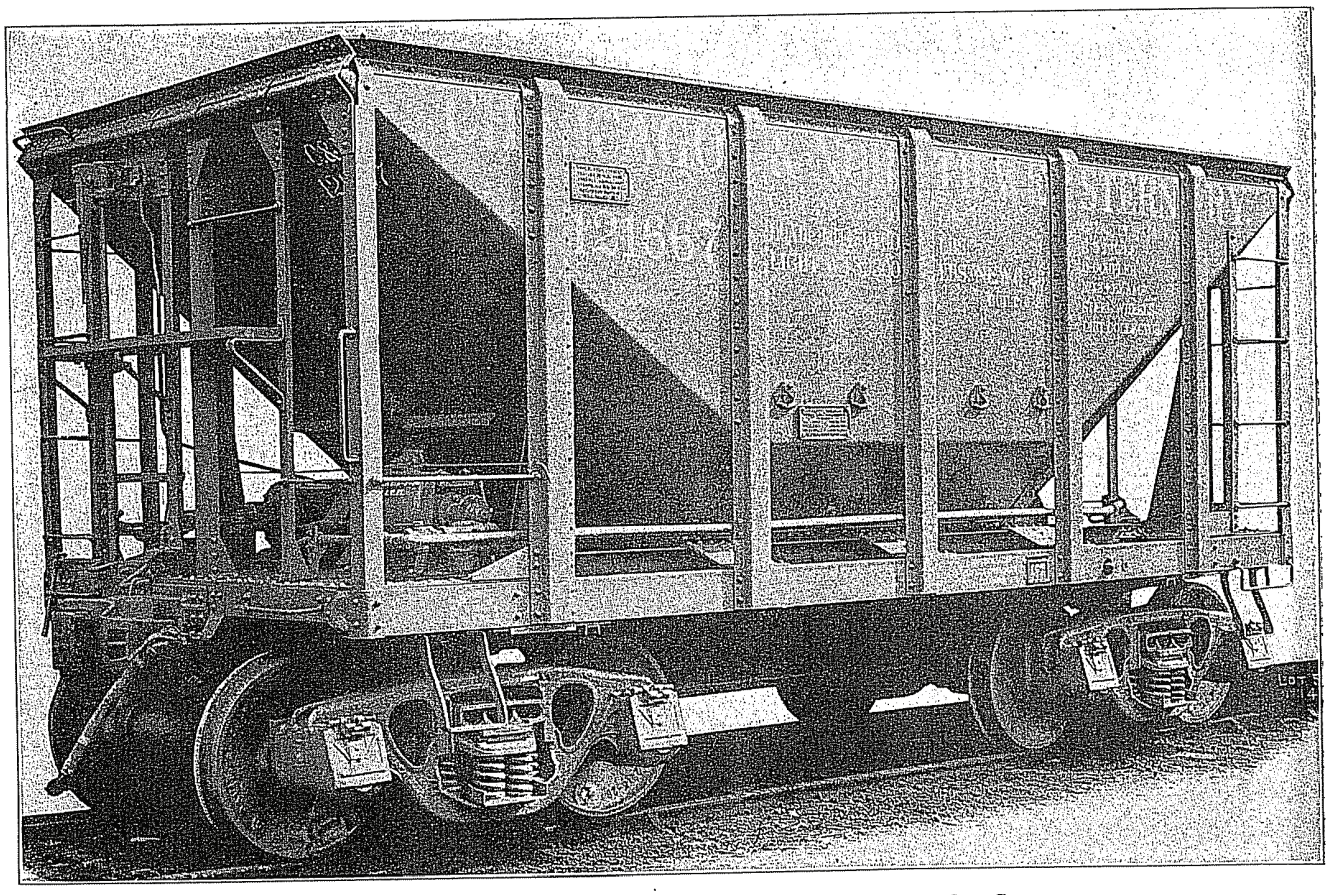

Fig. 411—Chicago & North Western 70-Ton Capacity Hopper Ore Car.

Capacity	140,000 lb.—975 cu. ft.	Length inside	21 ft. 2½ in.
Light weight	39,300 lb.	Length over striking faces	21 ft. 6½ in.
Load limit	170,700 lb.	Truck centers	15 ft. 0 in.
Door opening	39 sq. ft.	Height of side	10 ft. 6½ in.

(See also Fig. 412)

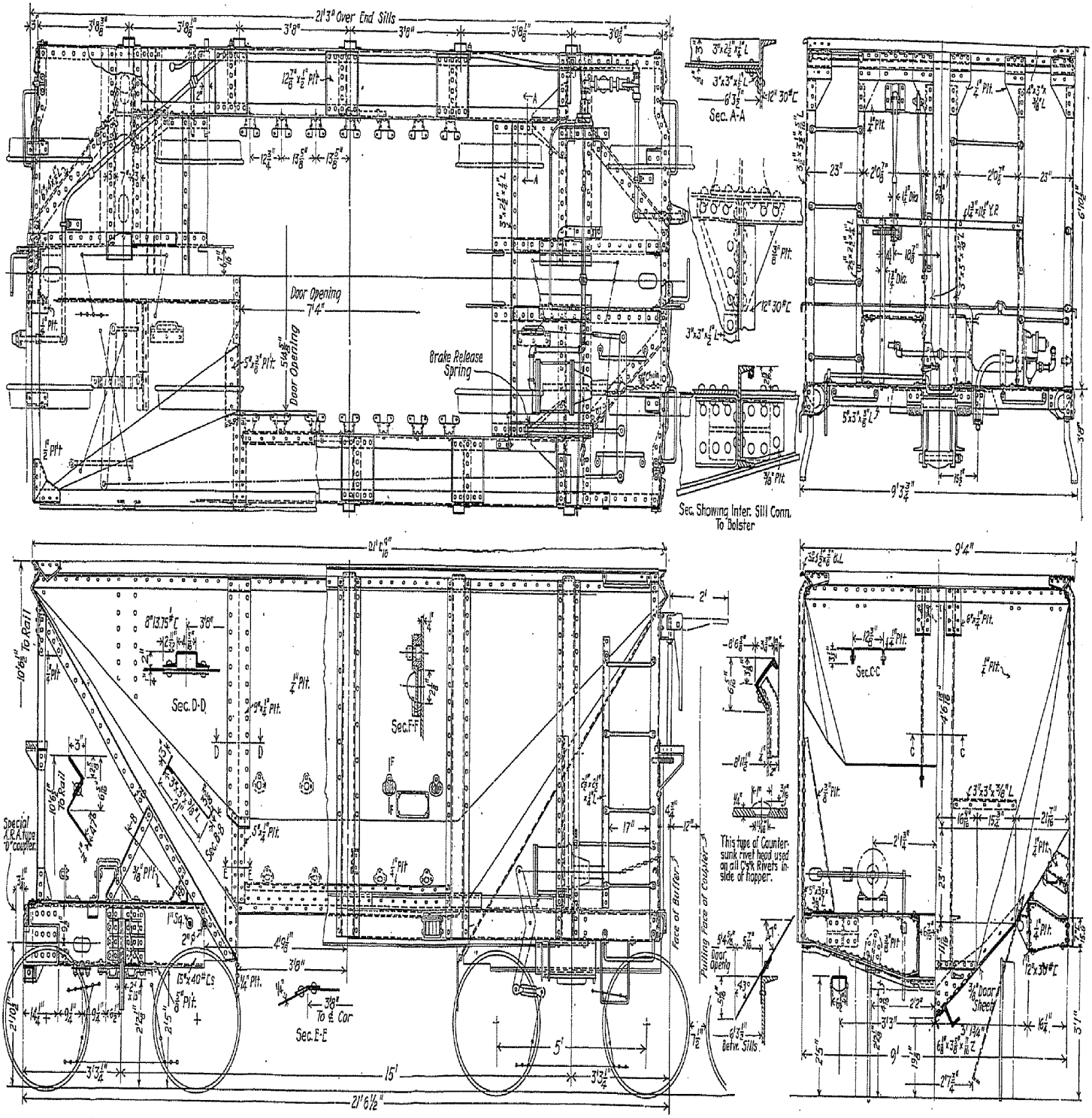

Fig. 412—Plan, Elevation and Sections of Chicago & North Western 70-Ton Capacity Hopper Ore Car.

(See also Fig. 411 and Section 3 for Details of Door Operating Mechanism)

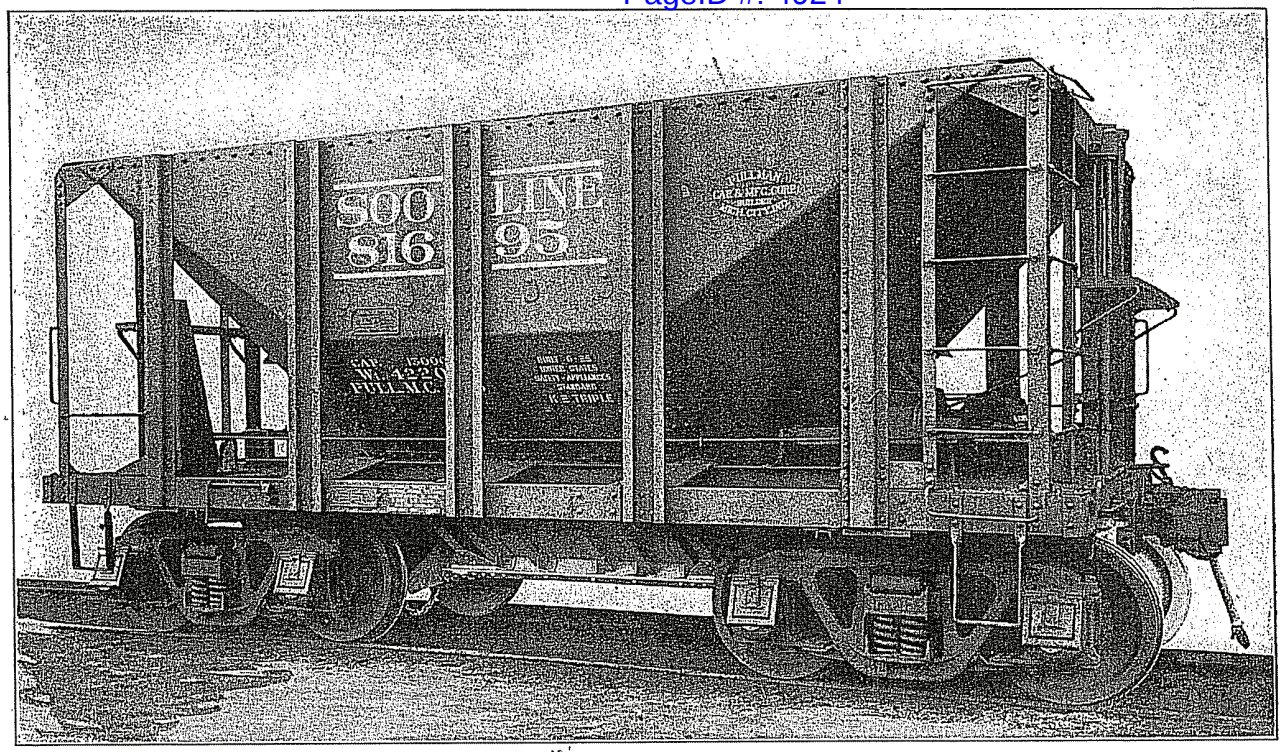

Fig. 413—Minneapolis, St. Paul & Sault Ste. Marie (Soo Line) 75-Ton Capacity Hopper Ore Car.

A. A. R. Class	HM
Nominal capacity	150,000 lb.
Load limit	167,800 lb.
Cubic capacity, level	1,080 cu. ft.
Light weight	42,200 lb.
Axle journals	6 in. × 11 in.
Length inside	19 ft. 8⅝ in.
Width inside	10 ft. 1½ in.
Height inside	8 ft. 6⅞ in.
Length over strikers	21 ft. 3 in.
Width outside	10 ft. 6 in.
Height of sides	10 ft. 2 in.

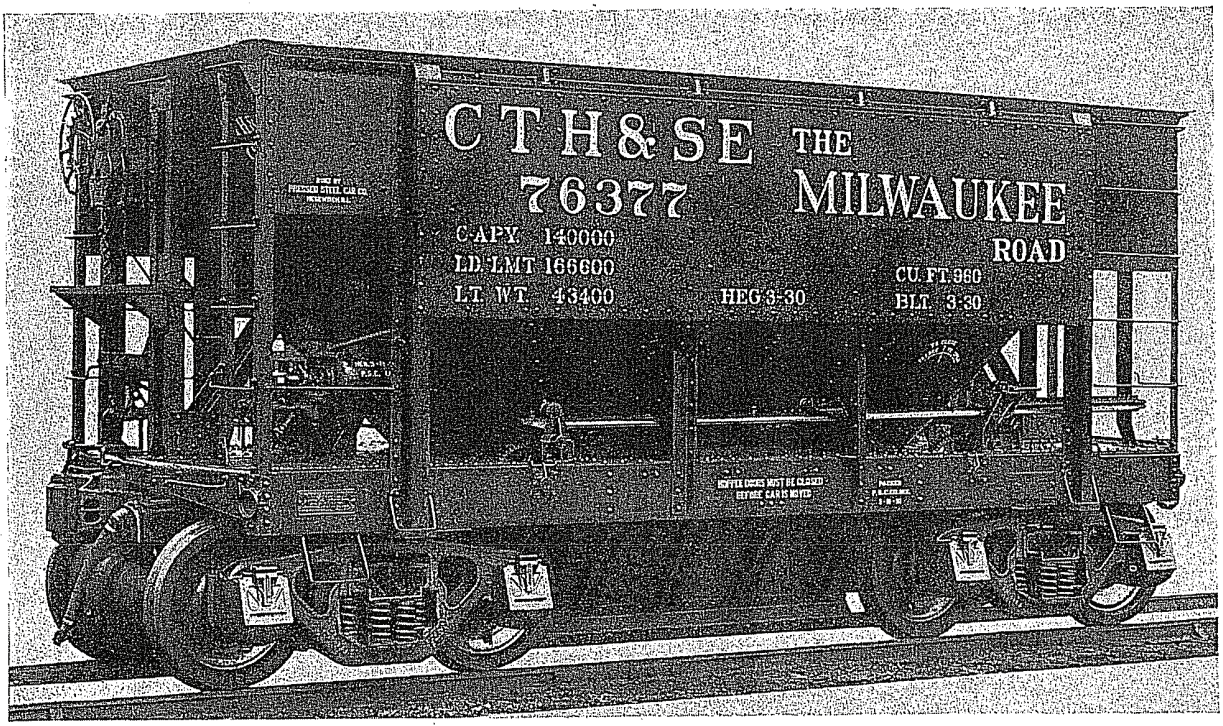

Fig. 414—Chicago, Terre Haute & Southeastern (C. M. St. P. & P.) 70-Ton Capacity Hopper Ore Car. Builder, Pressed Steel Car Company.

A. A. R. Class	HM
Nominal capacity	150,000 lb.
Load limit	166,600 lb.
Cubic capacity, level	960 cu. ft.
Cubic capacity, heaped	1,153 cu. ft.
Light weight	43,400 lb.
Axle journals	6 in. × 11 in.
Length over strikers	21 ft. 5¼ in.
Length inside	20 ft. 10½ in.
Width inside	9 ft. 2½ in.
Height of sides	10 ft. 6½ in.
Door opening, length	6 ft. 5½ in.
Door opening, width	5 ft. 11 in.

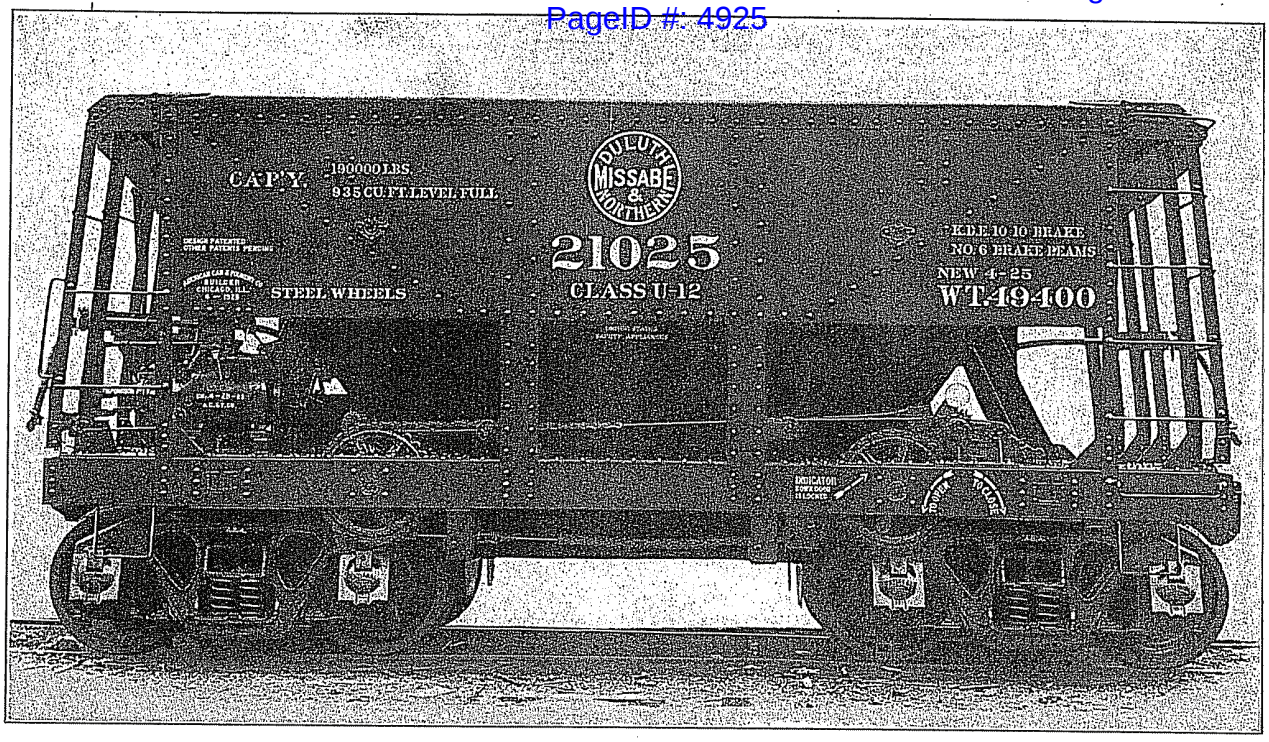

Fig. 415—Duluth, Missabe & Northern 95-Ton Capacity Hopper Ore Car, Road Class U12.

Nominal capacity	190,000 lb.	Length inside	19 ft. 5 in.
Load limit	201,600 lb.	Width inside	10 ft. 2 in.
Cubic capacity, level	935 cu. ft.	Height inside	6 ft. 6 in.
Light weight	49,400 lb.	Length over strikers	21 ft. 5½ in.
Axle journals	6½ in. × 12 in.	Width outside	10 ft. 5 in.
Truck centers	14 ft. 10 in.	Height of sides	10 ft. 2 in.

Fig. 416—Great Northern 75-Ton Capacity Hopper Ore Car, A. A. R. Class HM.

Nominal capacity	150,000 lb.	Length inside	19 ft. 10 in.
Load limit	168,700 lb.	Width inside	9 ft. 9⅝ in.
Cubic capacity, level	1,080 cu. ft.	Length over strikers	21 ft. 5½ in.
Light weight	41,300 lb.	Width outside	10 ft. 3¾ in.
Axle journals	6 in. × 11 in.	Height of sides	10 ft. 2 in.

1943
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Of American Practice

Definitions and Typical Illustrations of Railroad and Industrial Cars, Their Parts and Equipment; Cars Built in America for Export to Foreign Countries; Descriptions and Illustrations of Shops and Equipment Employed in Car Construction and Repair

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Rugged, dependable open top equipment for economy in general service

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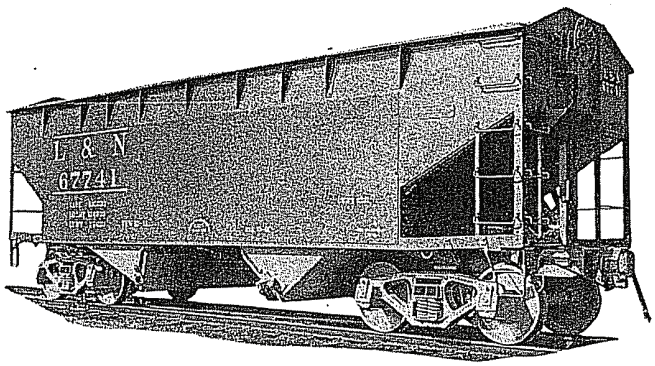
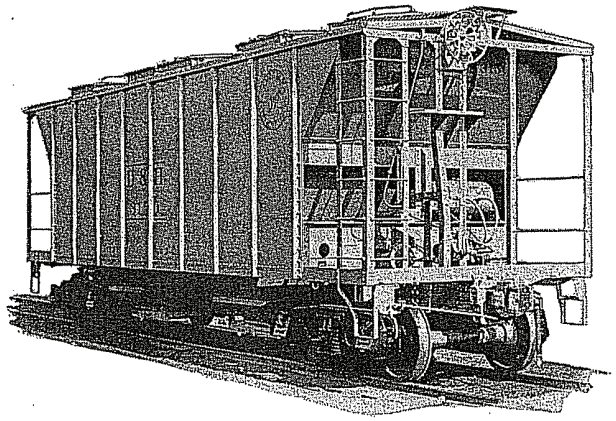
Improved and highly refined designs of covered hopper cars, originated and built by A.C.F. have been furnished to many railroads for the carriage of cement and other granular commodities. Dusttight and watertight construction affords perfect protection for the lading, the cost of bags and bagging is saved, and loading and unloading are quick and economical.

Commodities other than cement are also being handled in bulk shipments in cars built by A.C.F. These include carbon black, edible grains, wood flour, fullers' earth, soda ash, and similar finely divided or granular substances.

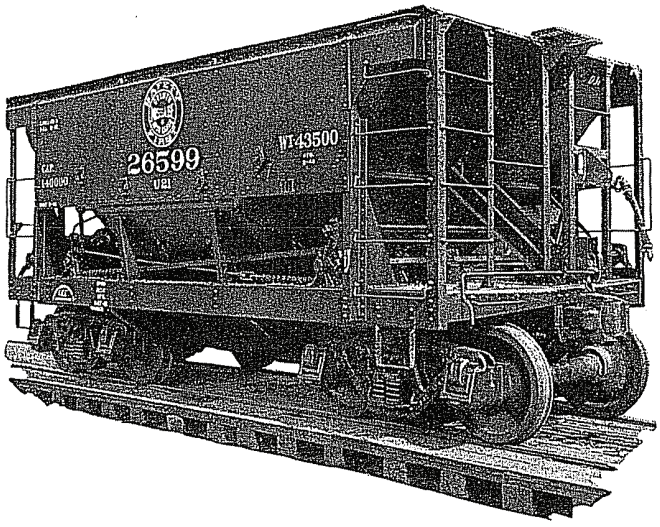


Above:—Louisville & Nashville, 50-ton twin hopper car. Inside length, 33 ft. 0 in.; width, 10 ft. 4 in.; height of sides, 10 ft. 8 in.; capacity, 2191 cu. ft.; weight, 39,300 lb.; load limit, 129,700 lb.



Late design of covered hopper car for bulk shipment of cement. Capacity, 140,000 lb.; load limit, 161,700 lb.; light weight, 48,300 lb.; cubic capacity, 2,040 cu. ft.

Below:—Duluth, Missabe & Iron Range, 75-ton hopper ore car. Length inside, 19 ft. 10⅞ in.; width, 10 ft. 5½ in.; height of sides, 10 ft. 2 in.; door opening, 2 ft. 7¾ in. wide by 6 ft. 10 in. long; weight, 43,500 lb.; load limit, 166,500 lb.



Open Top Cars for Ore and Coal

Numerous designs of open top hopper cars have also been developed, some with special provisions for improved handling of the wide variety of commodities shipped in this general type of freight car.

Some are fabricated from low-alloy steels to obtain light weight construction—others are built of copper-bearing steels to resist corrosion—and still others follow conventional lines employing ordinary carbon steels. The principal commodities which these cars are designed to handle include not only coal and ore, but also coke, limestone, gravel, trap rock, sand, and all materials of this character.

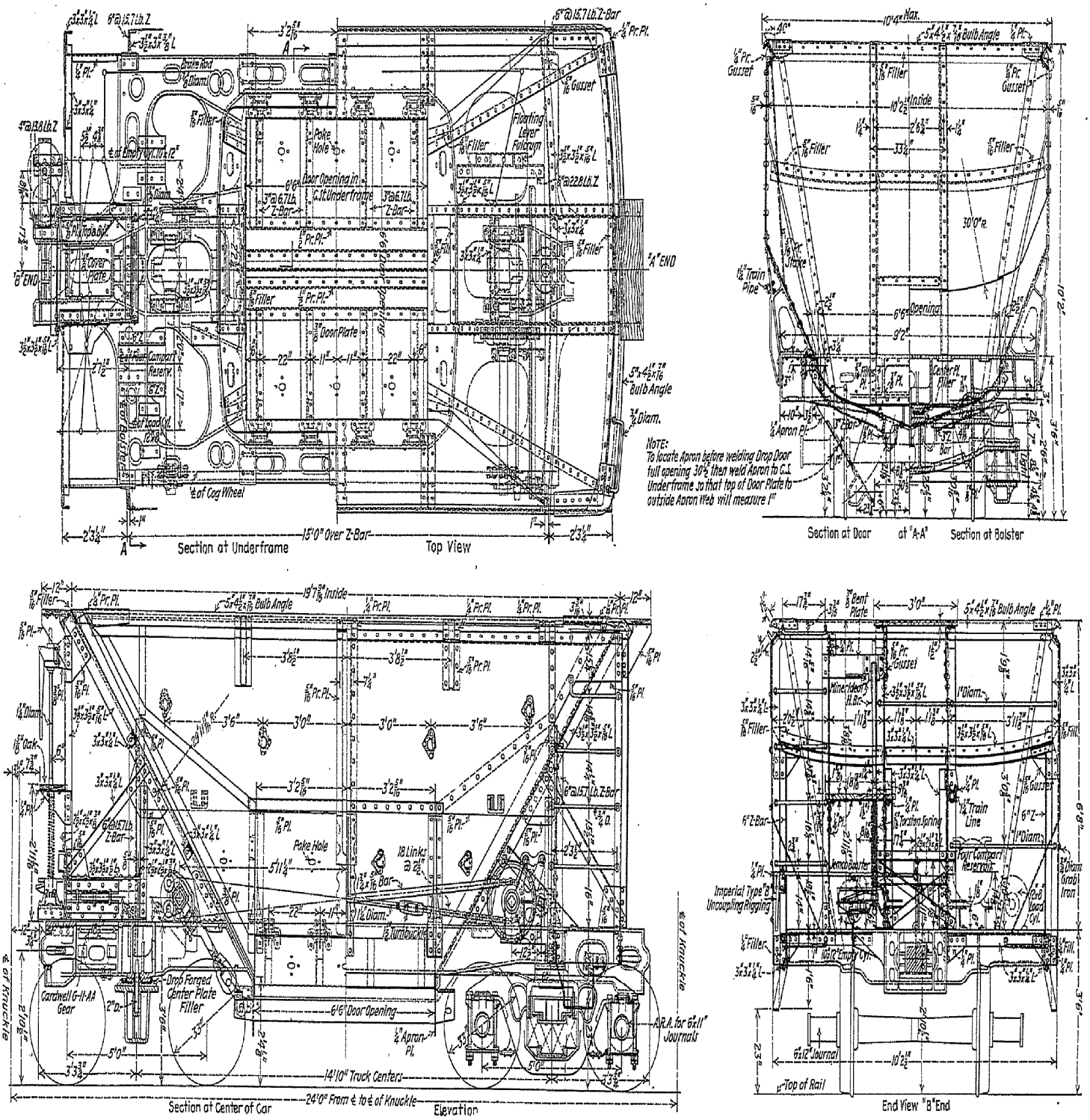


Fig. 2.666—Plan, elevation and sections of Duluth, Missabe & Iron Range 80-ton capacity hopper ore car with Commonwealth cast steel underframe. Road Class U-14.
Roads Nos. 22,001-22,125; capacity, 935 cu. ft.; light weight, 47,600 lb.; load limit, 162,400 lb.
Descriptions: *Railway Age*, Feb. 8, 1928. *Railway Mechanical Engineer*, May 1928
(Later cars have been of fabricated type. See Fig. 2.667)
(For ore car door operating mechanism see Sec. 3)

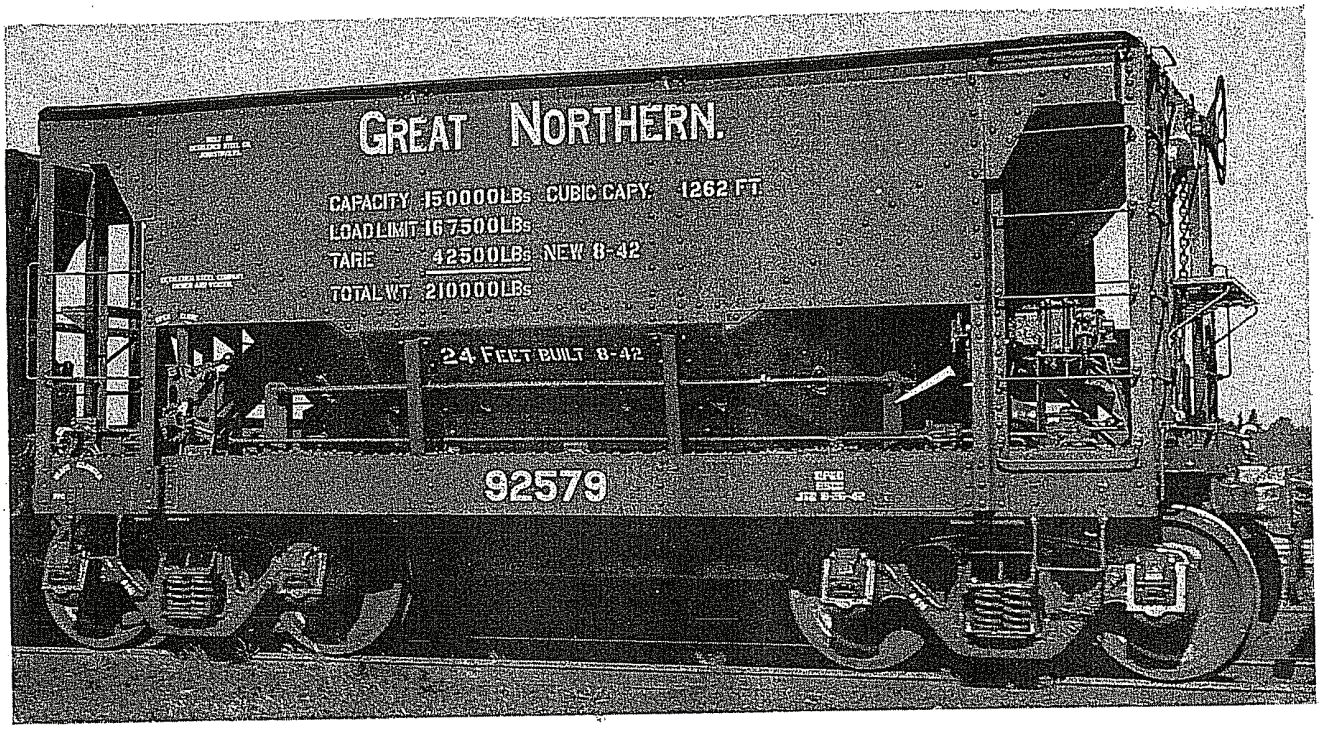


Fig. 2.667—Great Northern 75-ton capacity hopper iron ore car. Series 90,000-92,999. Builder, Bethlehem Steel Company.

A. A. R. Class	HMA	Length inside	19 ft. 10⅞ in.
Nominal capacity	150,000 lb.	Width inside	10 ft. 5½ in.
Load limit	167,500 lb.	Coupled length	24 ft. 0 in.
Cubic capacity, level	1,262 cu. ft.	Length over strikers	21 ft. 5¼ in.
Light weight	42,500 lb.	Width outside	10 ft. 6 in.
Axle journals	6 in. x 11 in.	Height of sides	10 ft. 2 in.

Fig. 2.668—Duluth, Missabe & Iron Range 70-ton capacity hopper iron ore car. Road Class U19. Builder, Pullman-Standard Car Manufacturing Co.

A. A. R. Class	HMA	Axle journals	6 in. x 11 in.
Nominal capacity	140,000 lb.	Length over strikers	21 ft. 6 in.
Load limit	166,400 lb.	Length inside	19 ft. 10 in.
Cubic capacity, level	1,000 cu. ft.	Width inside	10 ft. 5 in.
Light weight	43,600 lb.	Height of sides	10 ft. 2 in.

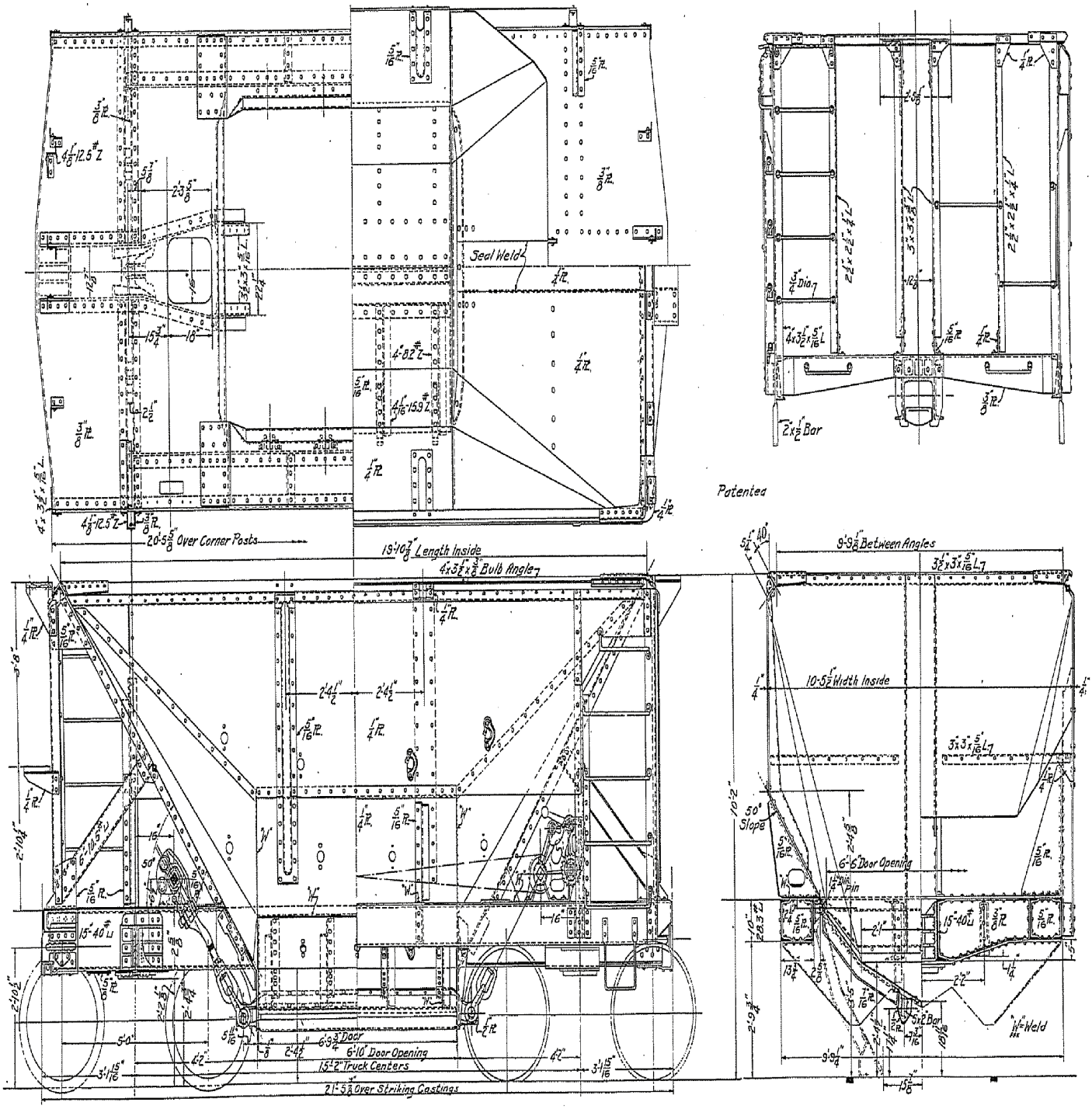


Fig. 2.669—75-Ton all-steel 6 in. by 11 in. axle load Enterprise hopper iron ore car, center discharge. Cubic capacity, 1,040 cu. ft. level or 1,244 cu. ft. with 12-in. average heap.

Enterprise Railway Equipment Company

(See also Page 289)

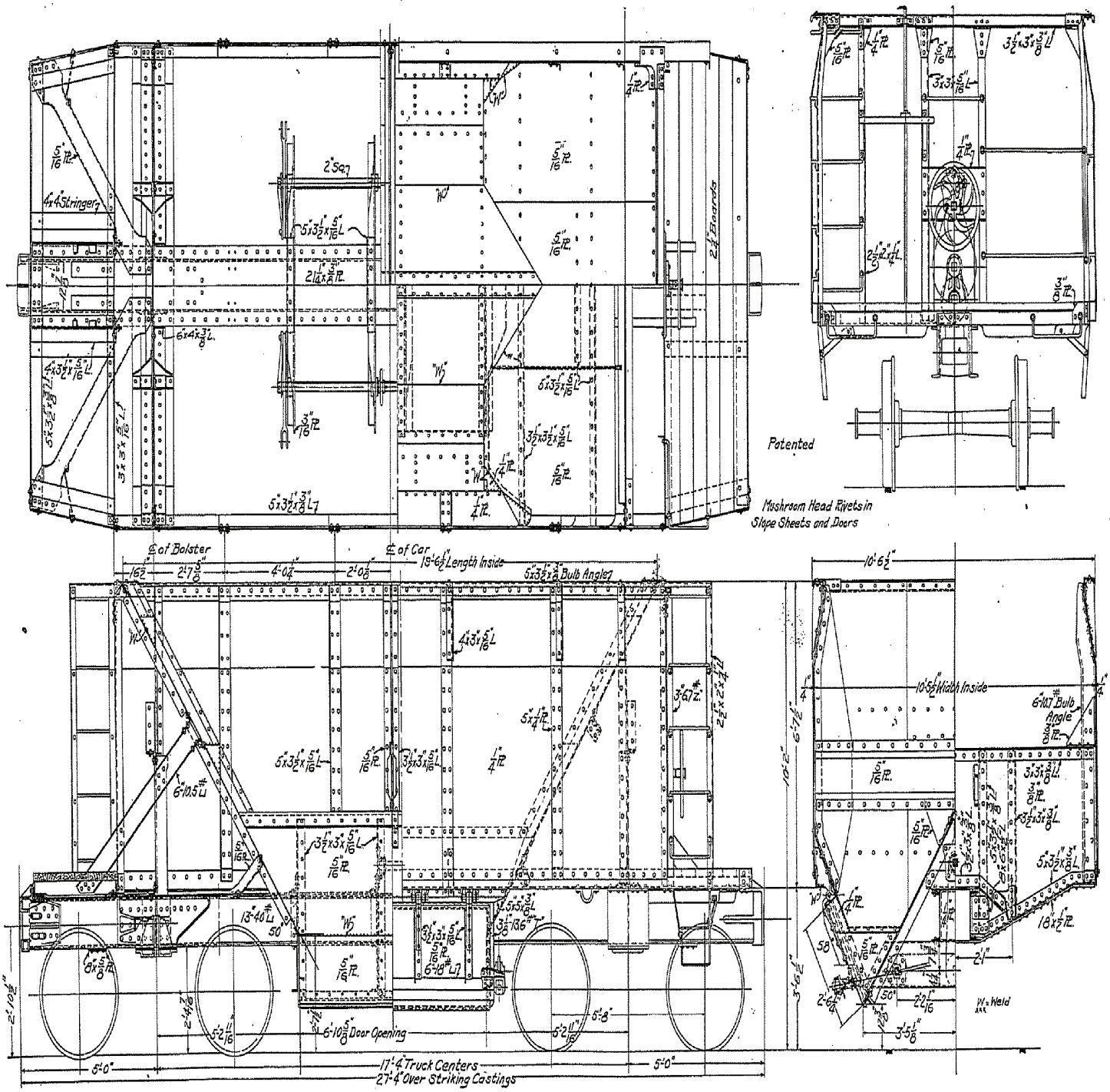


Fig. 2.670—70-Ton all-steel Enterprise hopper ore car, side discharge. Cubic capacity, 981 cu. ft. level or 1,170 cu. ft. with 12 in. average heap.

Enterprise Railway Equipment Company

(See also Page 289)

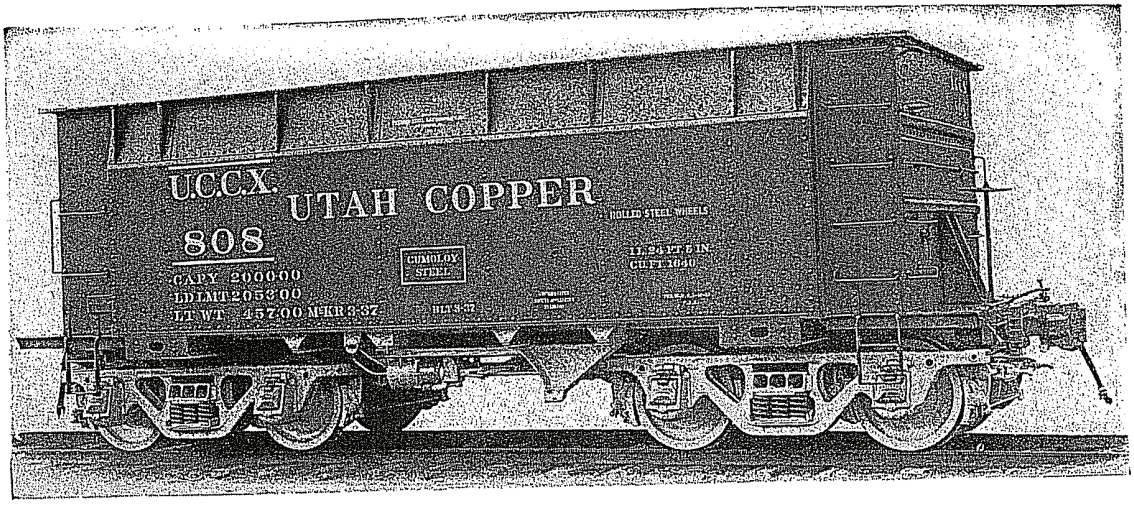


Fig. 2.671—Utah Copper Company 200,000-lb. capacity high-tensile steel ore car. Unloaded by car dumper. Builder, Pressed Steel Car Company, Inc.

Light weight, 45,700 lb.; load limit, 205,300 lb.; capacity, 1,640 cu. ft.; inside, length 24 ft. 5 in.; width 10 ft. 6 in.; height 6 ft. 6¾ in.

Description: Railway Age, October 30, 1937

Fig. 2.672—Union Pacific (O.-W. R. & N.) 70-ton ore car, AAR Class HMA. Builder, St. Louis Car Company.

Light weight, 62,300 lb.; load limit, 147,700 lb.; capacity, 1,360 cu. ft.; inside, length 28 ft. 0 in.; inside, width 9 ft. 6 in.

Fig. 2.673—Canadian National 80-ton ore car with four drop bottom doors, each side, AAR Class GS.

Light weight, 48,700 lb.; load limit, 161,300 lb.; capacity, 1,080 cu. ft.; length inside, 22 ft. 11 in.

Enterprise Bulk Commodity, Ore and Ballast Cars

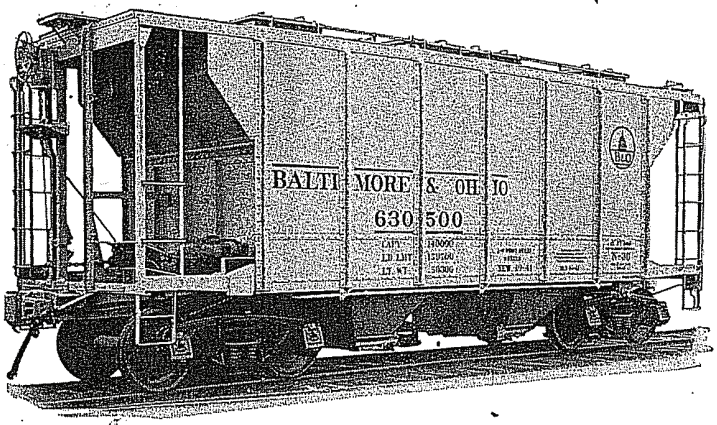


Fig. 2.678—70-ton Bulk Commodity Covered Hopper Car

THE Bulk Commodity Covered Hopper Car has become a standard service car for many commodities formerly hauled in sack, barrel or loosely in box cars.

The Enterprise Outlet Unit illustrated in Fig. 2.679

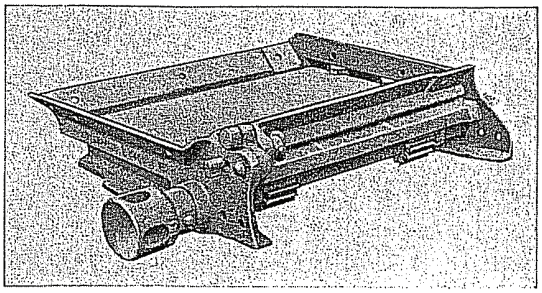


Fig. 2.679—Enterprise Bulk Commodity Outlet

is of cast steel, a finished machined product which provides a close, tight seal against leakage, a large opening and convenient means for operating. For general plan of Enterprise 70-ton car see Fig. 2.677, page 288 and application of outlet see Fig. 3.227, page 475.

The Enterprise has also developed a new seal tight Hatch with Door Lock for use in loading this type of car, which is illustrated and shown applied in Fig. 2.677, page 288, details, Figs. 3.231 and 3.233, page 477.

Enterprise Multi-Service Ballast Cars

The Enterprise Type A Multi-Service Ballast Car illustrated in Fig. 2.680 is of 55 tons capacity and of Standard A.A.R. dimensions, 34 ft. 0 in. overall length and 10 ft. 8 in. height.

The car is designed to release ballast from a moving train to the sides or center of the track, free of the rails and in quantities as desired by the operator. The floors of the car are steep; corner pockets are eliminated and the passageways between the floors and outlet hoppers are wide, providing for a free unrestricted flow of the ballast which is essential to prompt and clean unloading of the car. For general design, see page 275.

There is also an Enterprise Type B Coal-Ballast Car, the 50-60-70-80. This is a standard A.A.R. hopper car (modified in hoppers only) using Enterprise Ballasting Hoppers, doors and door-operating mechanism. This design of car provides for an increased use of standard A.A.R. car parts and with the lower position and lesser slope of the car floors makes available an increase in the capacity for coal. The general dimensions of this car are the same as an A.A.R. 50-ton hopper and the finished weight substantially the same as the Enterprise Type A Multi-Service Ballast Car. This car is suitable for 61 tons of coal or other lading.

By a slight increase in thickness of the Body Bolster and the use of 70-ton trucks, the car would be suitable for 65 tons of coal or 80 tons of ballast and other heavy materials. For general design see page 278.

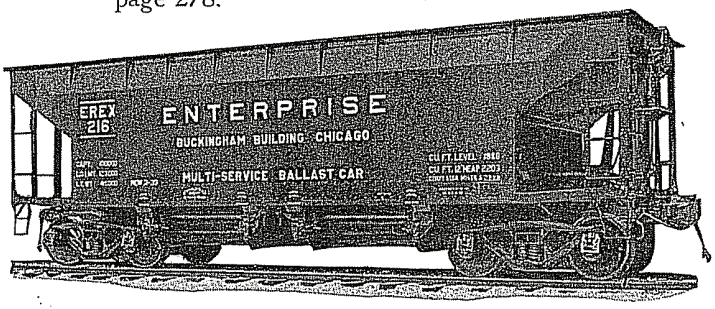


Fig. 2.680—55-ton Multi-Service Car

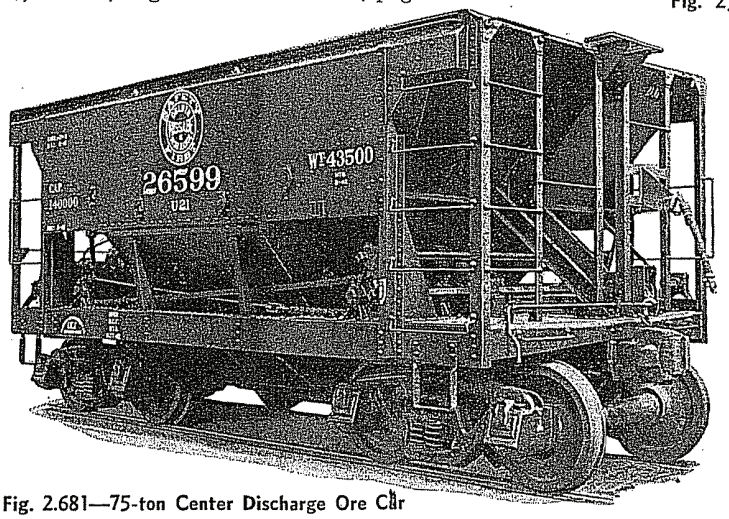


Fig. 2.681—75-ton Center Discharge Ore Car

Enterprise Ore Car—Door Mechanism

The 75-ton Hopper Ore Car shown in Fig. 2.681 illustrates the Center Discharge Car commonly used in the Iron Ore Service. Steep floors, rounded corners and a large door opening are essential to quick and free discharge of the load. The door opening is closed by a pair of longitudinally hinged doors which are controlled by the Enterprise Door Mechanism which is operative from either side of the car and securely locks the doors when in closed position. A general plan of Enterprise 75-ton ore car is illustrated in Fig. 2.669, page 284. A side discharge ore or concentrate car is illustrated in Fig. 3.670, page 285.

1957

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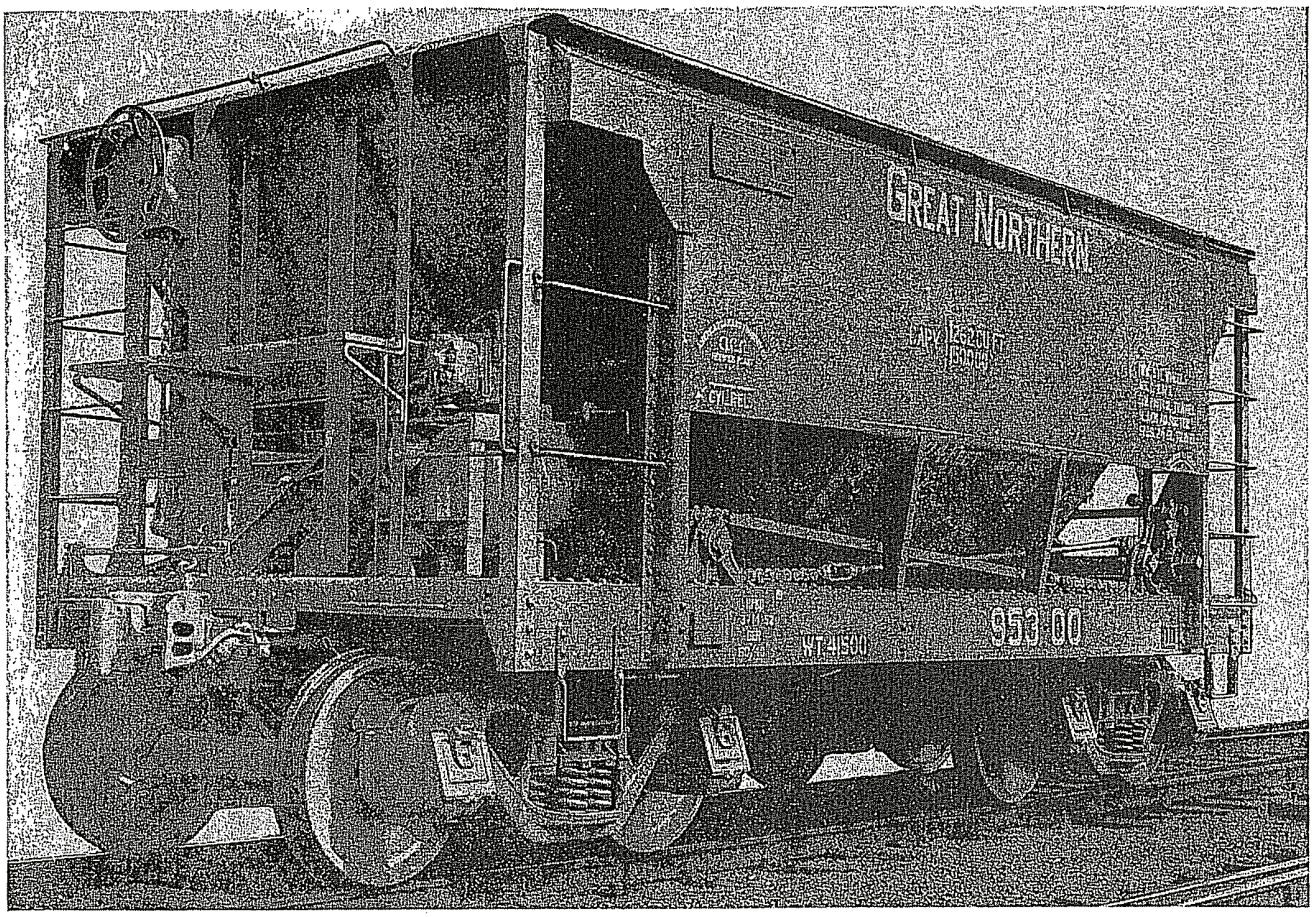
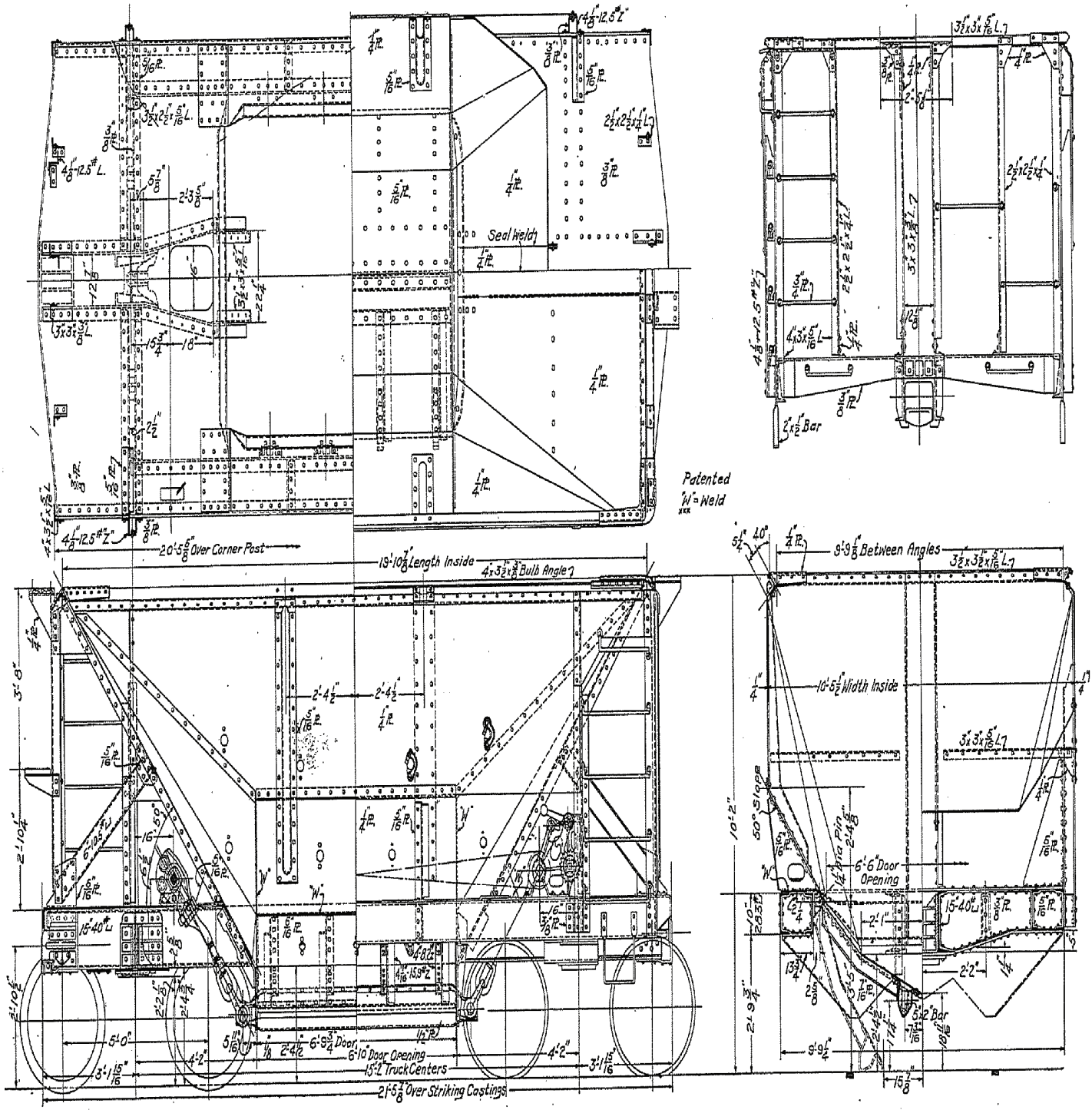


Great Northern 75-ton hopper ore car. Builder, American Car and Foundry Div., ACF Industries, Inc.
Light weight 41,500 lb.; capacity 1,262 cu. ft.; inside length 19 ft. 10 in.; width 10 ft. 5 in.; height to top of car 10 ft. 2 in.

Union Pacific 70-ton hopper ore car. Built in Company shops at Omaha, Neb.
Light weight 48,300 lb.; load limit 161,700 lb.; capacity 1,096 cu. ft.; inside length 20 ft. 9 in.; width 10 ft. 5 in.

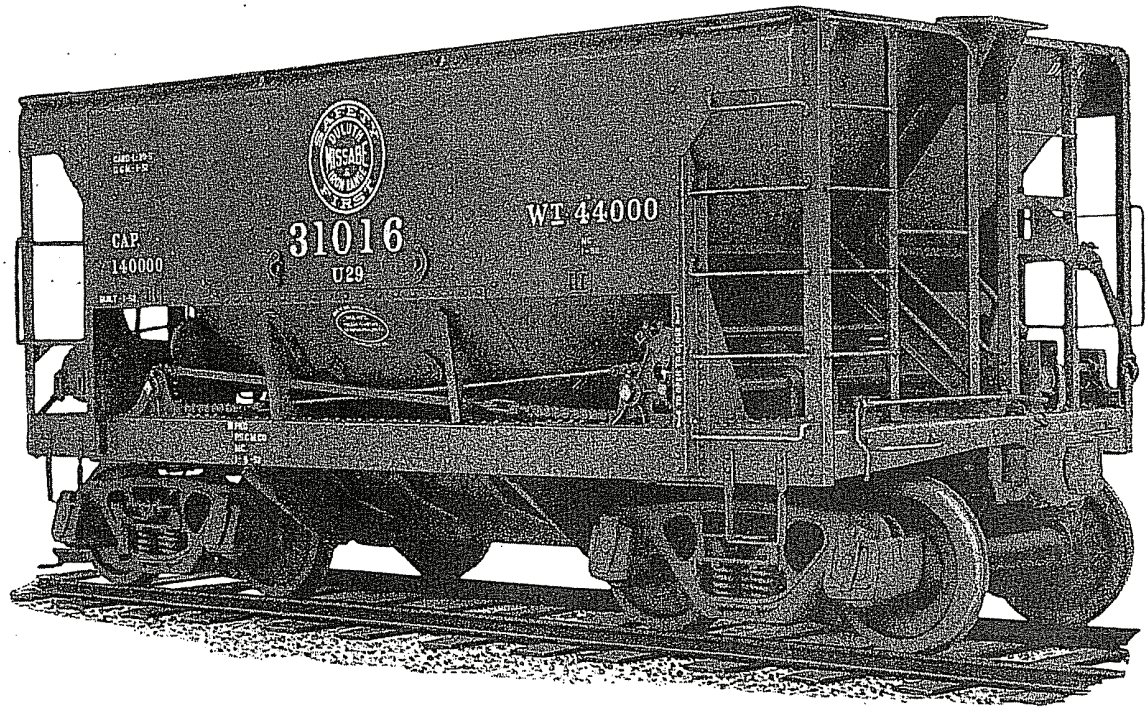


70-Ton all-steel 6 in. by 11 in. axle load Enterprise hopper iron ore car, center discharge. Cubic capacity 1,040 cu. ft. level or 1,244 cu. ft. with 12-in. average heap.

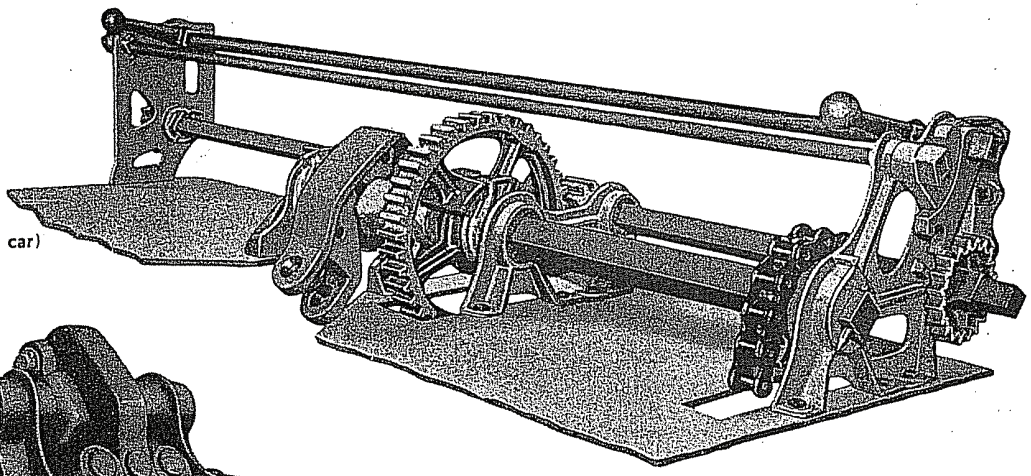
Enterprise Railway Equipment Company

(See also opposite page)

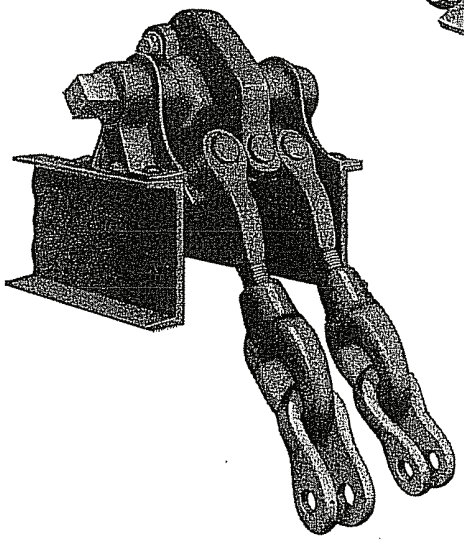
Enterprise Door Operating Mechanism for Ore Cars



70-ton Center Discharge Ore Car.



Enterprise Door Latch and Operating Mechanism (Operative from either side of car)



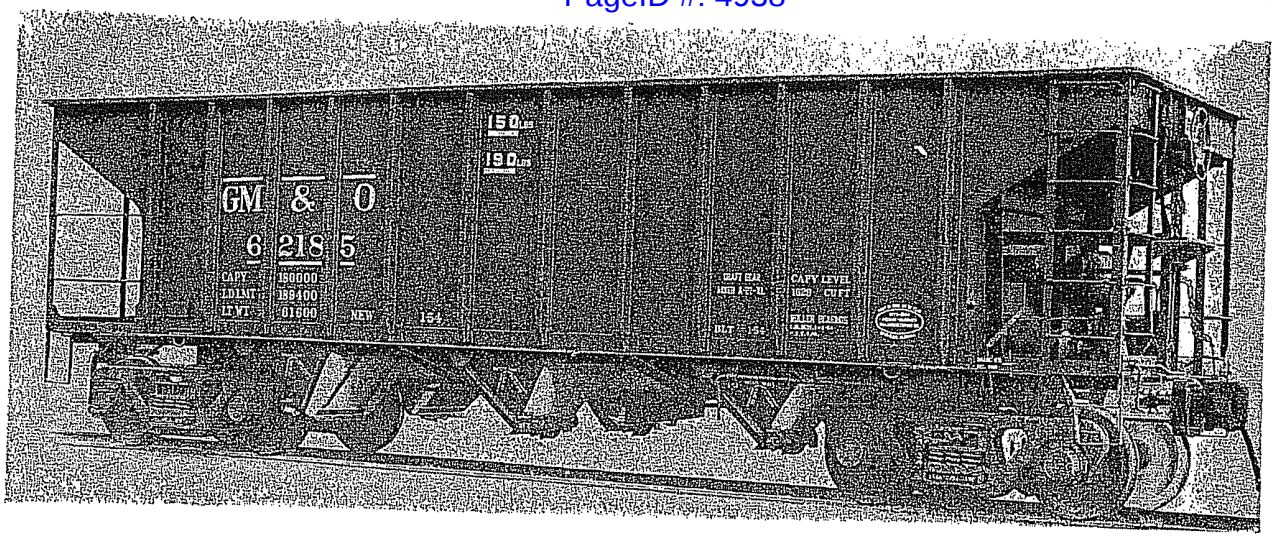
Enterprise Ore Car Dumping Mechanism.

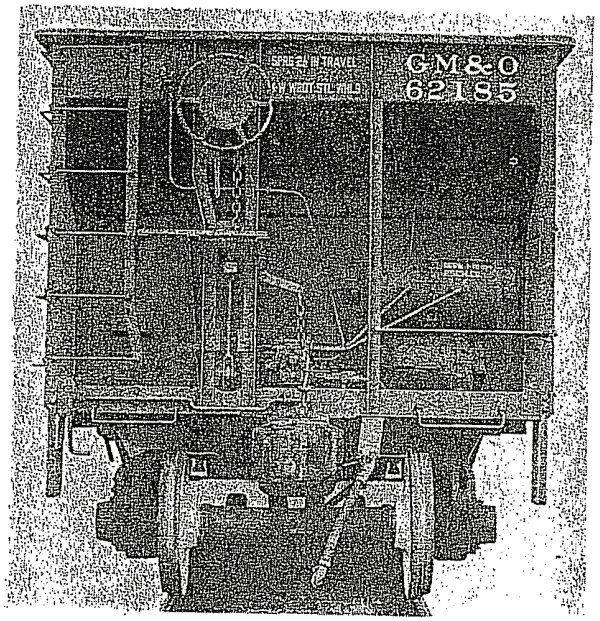
The 70-ton Hopper Ore Car shown above illustrates the center discharge car commonly used in iron ore service. Steep floors, rounded corners and large door openings insure quick and free discharge of the load. The door opening is closed by a pair of longitudinally hinged doors which are controlled by the Enterprise Door Mechanism, which is operative from either side of the car and securely locks the doors when in closed position. A general plan of the Enterprise 70-ton ore car is illustrated on page 266.

Blueprints of the standard Enterprise 70-ton center discharge ore car are available on request. Blueprints and information on Enterprise side discharge ore cars are also available.

ENTERPRISE RAILWAY EQUIPMENT COMPANY, 59 E. Van Buren St., CHICAGO 5, ILL.

Products and Branch Offices Are Listed in the Classified Indexes

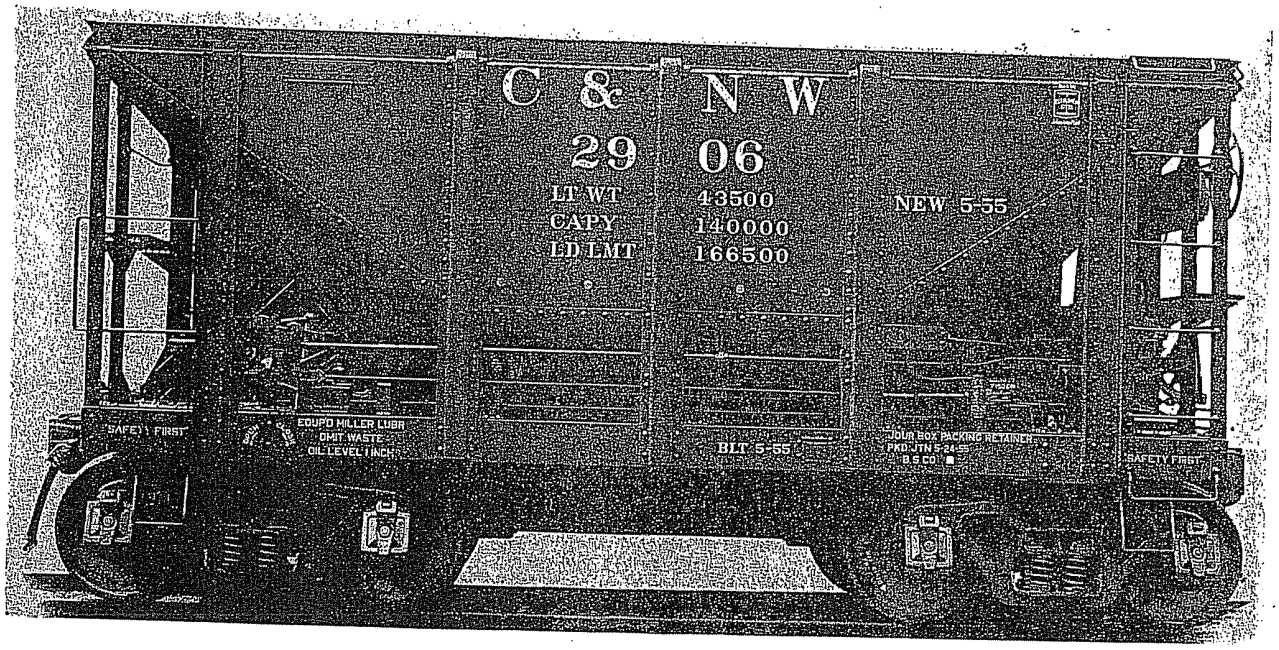




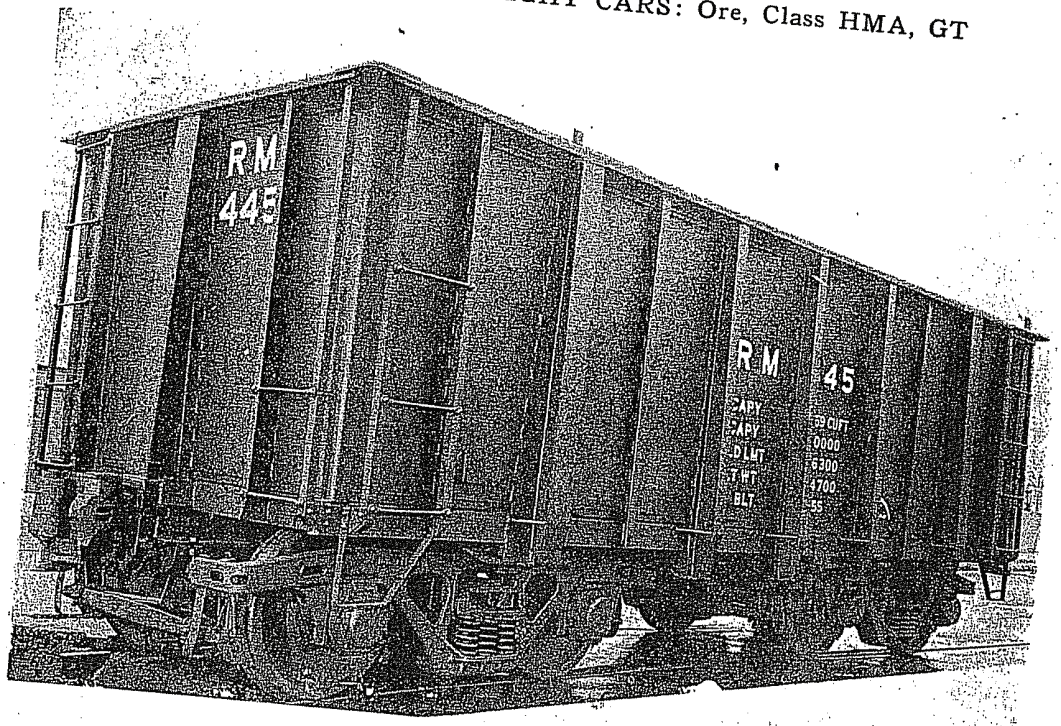
Above—Gulf, Mobile & Ohio 95-ton bulk iron ore car. Builder, Pullman-Standard Car Manufacturing Co.
Light weight 61,600 lb.; load limit 189,400 lb.; capacity 1,629 cu. ft.; inside length 29 ft. 8 in.; width 9 ft. 8 in.; height 7 ft. 2.

Left—End view of car shown above.

Below—Chicago & North Western 70-ton iron ore car. Builder, Bethlehem Steel Co.
Light weight 43,500 lb.; load limit 166,500 lb.; capacity 975 cu. ft.; inside length 21 ft. 2½ in.; width 8 ft. 11½ in.; height 10 ft. 6½ in.



FREIGHT CARS: Ore, Class HMA, GT



Reserve Mining 95-ton ore car, roller bearing equipped. Builder, American Car and Foundry Div., ACF Industries, Inc.

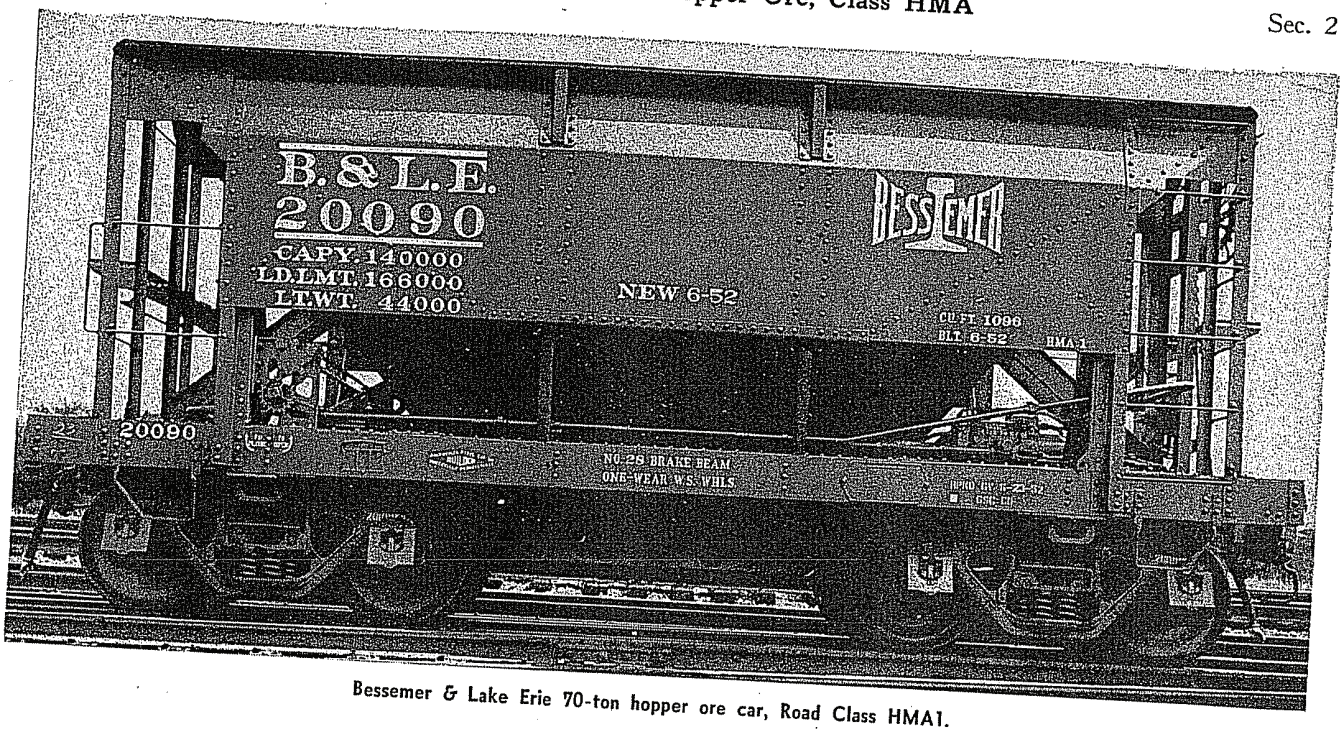
Inside length at top 25 ft. 8 in., at floor 25 ft. 2¼ in.; width at top 9 ft. 9 in., at floor 9 ft. 3¼ in.; height 6 ft. 6-5/16 in.; light weight 54,700 lb.; load limit 196,300 lb.

Atchison, Topeka & Santa Fe 90-ton solid bottom ore car with Commonwealth one piece cast steel underframe.

Inside length 27 ft. 0 in.; width 9 ft. 3 in.; height 6 ft. 6 in.; capacity 1,623 cu. ft.; light weight 70,800 lb.; load limit 180,200 lb.

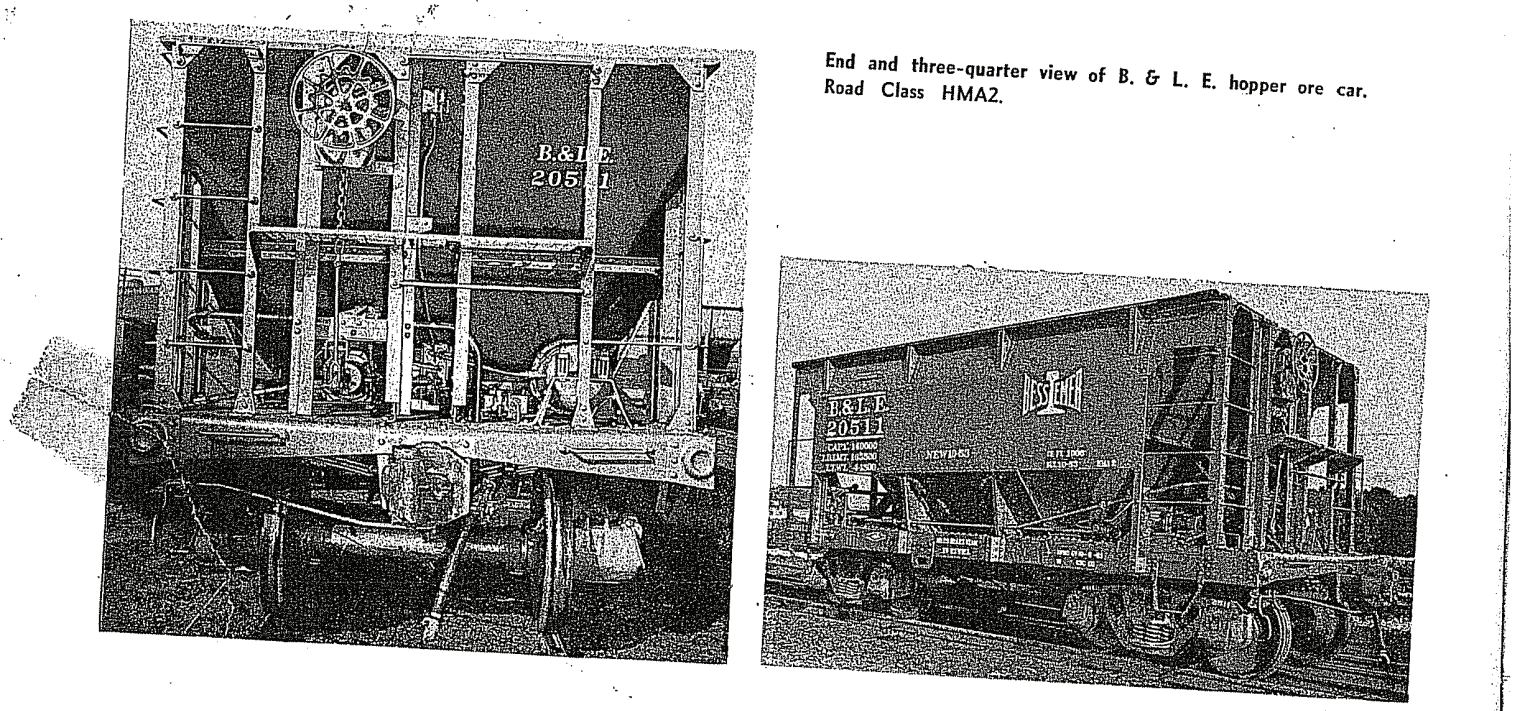
Canadian National 90-ton center flow hopper ore car. Builder, National Steel Car Corporation, Ltd.

Inside length 19 ft. 10 in.; width 10 ft. 5 in.; capacity 1,000 cu. ft.; light weight 43,000 lb.; load limit 167,000 lb.



Bessemer & Lake Erie 70-ton hopper ore car, Road Class HMA1.

Length, inside at top	20 ft. 9 in.
Length over striking plate	24 ft. 8 in.
Length, coupled	27 ft. 2 in.
Width, outside	10 ft. 6 in.
Height, from rail to top of car	10 ft. 8 in.
Capacity	1,096 cu. ft.
Capacity	140,000 lb.
Load limit	166,000 lb.
Light weight	44,000 lb.
Slope, floor	50 deg.



End and three-quarter view of B. & L. E. hopper ore car. Road Class HMA2.

Greenville Steel Car Co.

1961
Car Builders' Cyclopedia
Of American Practice

Definitions and Typical Illustrations of Railroad and Industrial Cars, Their Parts and Equipment; Cars Built in America for Export to Foreign Countries; Descriptions and Illustrations of Shops and Equipment Employed in the Construction and Repair of Cars

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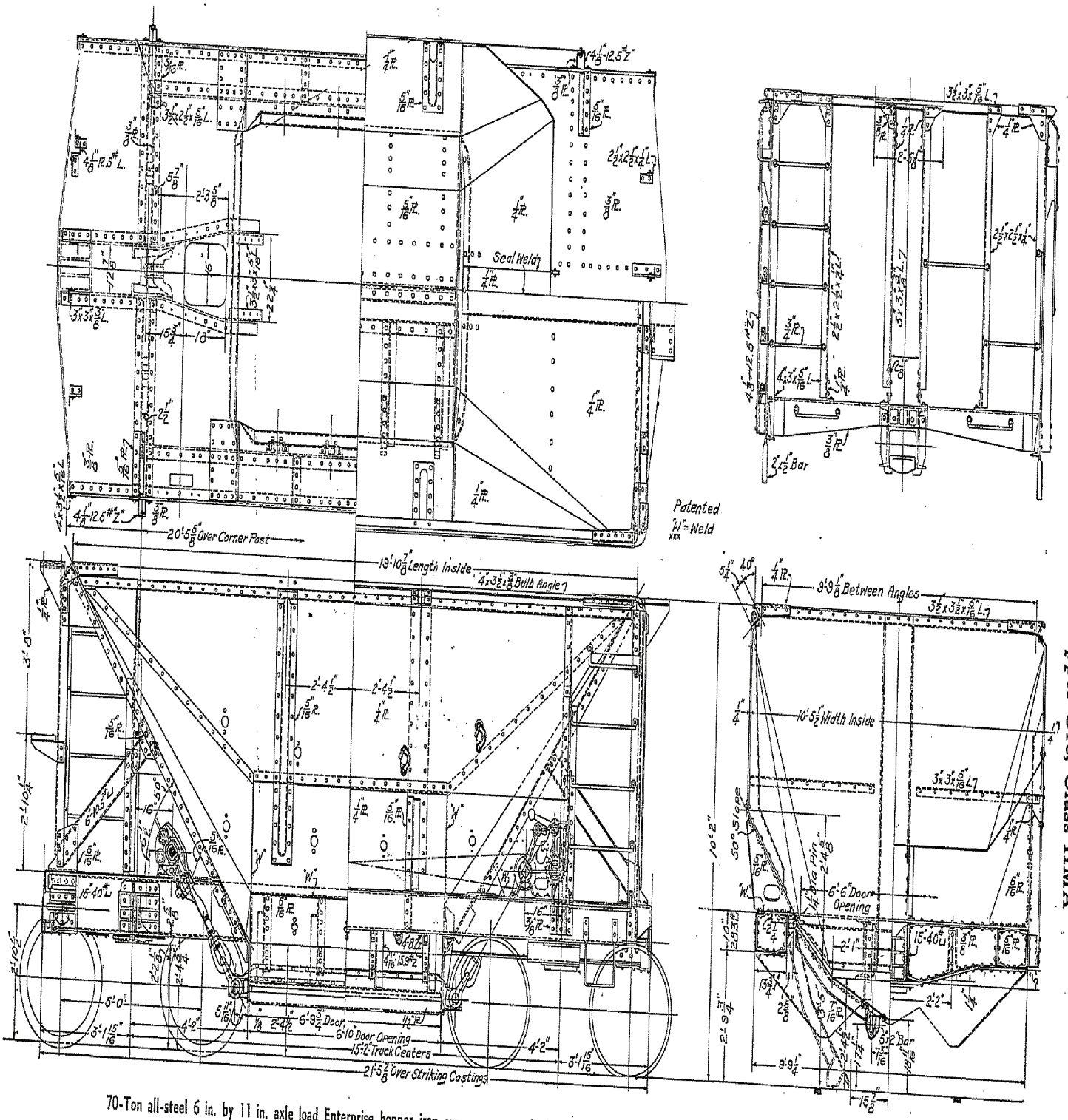
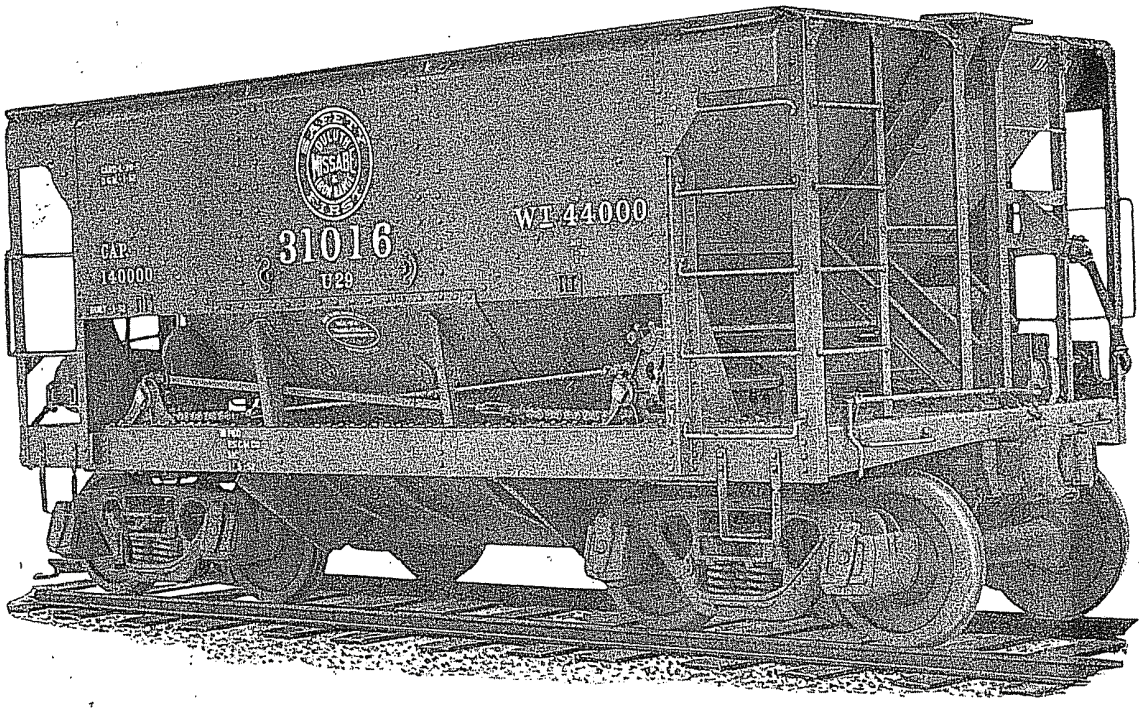


70-Ton all-steel 6 in. by 11 in. axle load Enterprise hopper iron ore car, center discharge. Cubic capacity 1,040 cu. ft. level or 1,244 cu. ft. with 12-in. average heap.

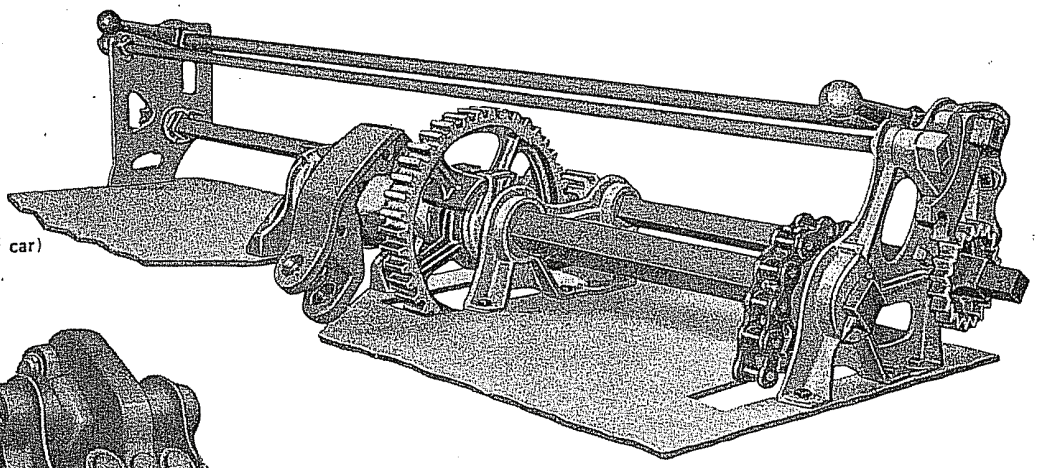
Enterprise Railway Equipment Company

(See also opposite page)

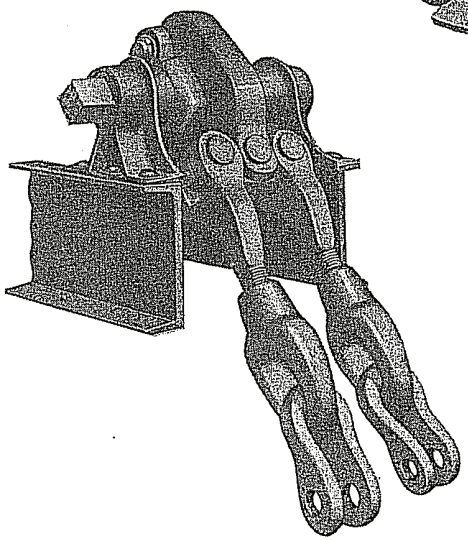
Enterprise Door Operating Mechanism for Ore Cars



70-ton Center Discharge Ore Car.



Enterprise Door Latch and Operating Mechanism (Operative from either side of car)



Enterprise Ore Car Dumping Mechanism.

THE 70-ton Hopper Ore Car shown above illustrates the center discharge car commonly used in iron ore service. Steep floors, rounded corners and large door openings insure quick and free discharge of the load. The door opening is closed by a pair of longitudinally hinged doors which are controlled by the Enterprise Door Mechanism, which is operative from either side of the car and securely locks the doors when in closed position. A general plan of the Enterprise 70-ton ore car is illustrated on page 246.

Blueprints of the standard Enterprise 70-ton center discharge ore car are available on request. Blueprints and information on Enterprise side discharge ore cars are also available.

ENTERPRISE RAILWAY EQUIPMENT COMPANY, 59 E. Van Buren St., CHICAGO 5, ILL.

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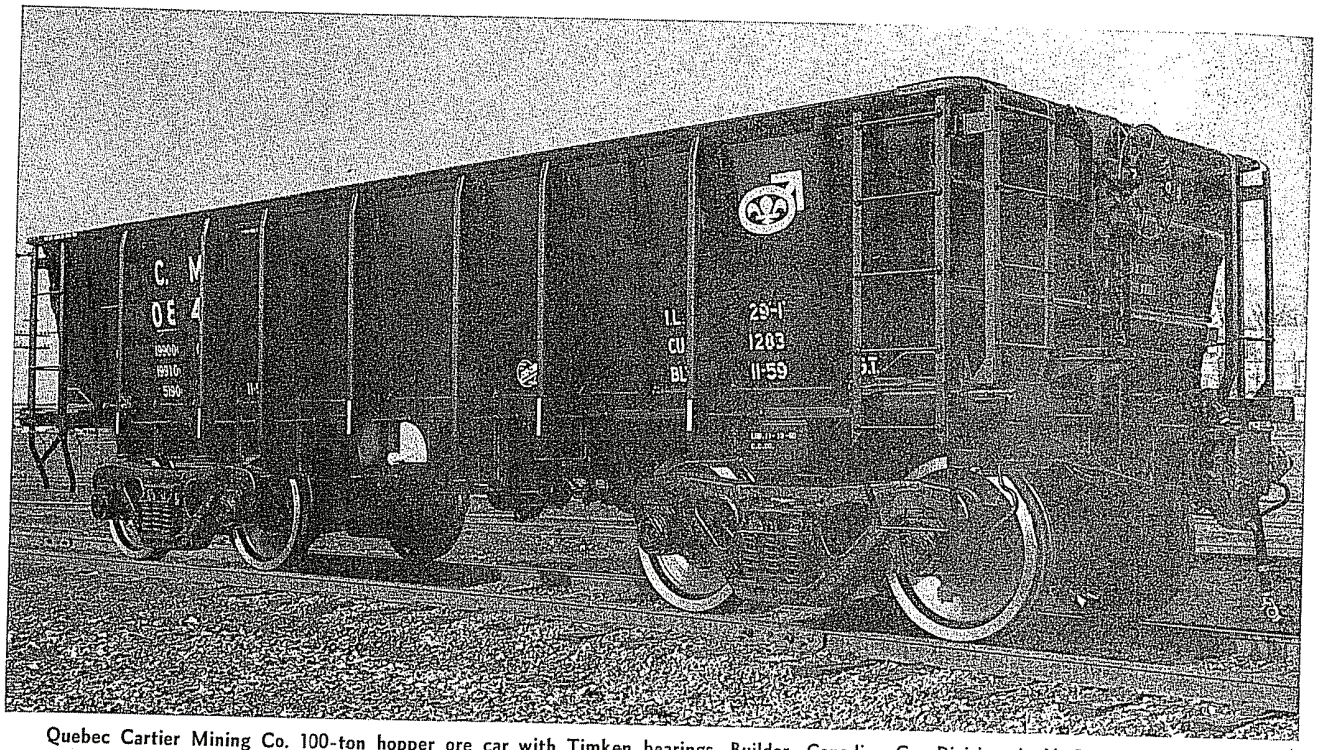
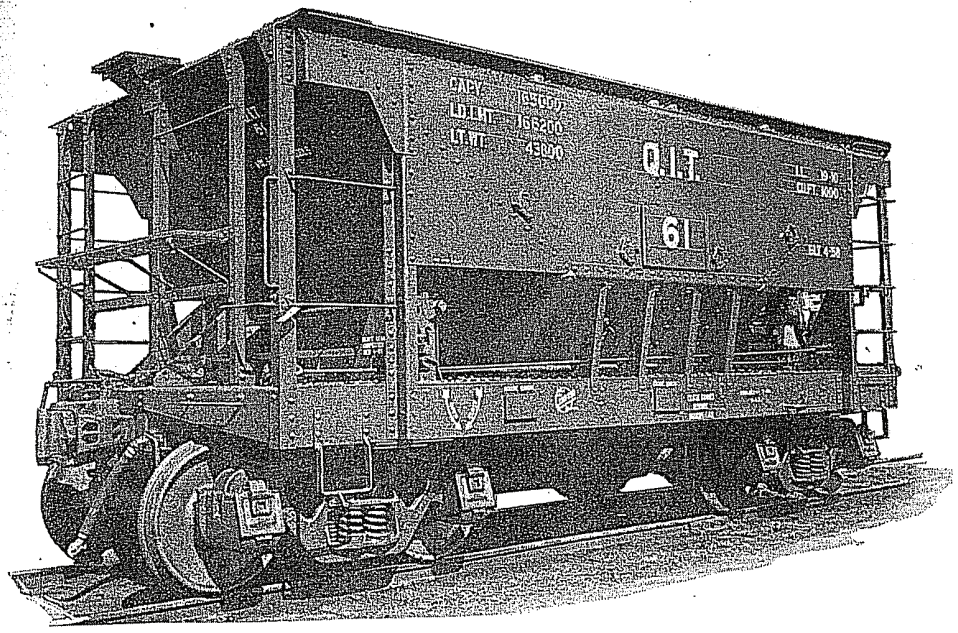


Quebec Cartier Mining Co. 100-ton hopper ore car with Timken bearings. Builder, Canadian Car Division A. V. Roe Canada Limited.
Inside length 29 ft. 1⅜ in.; width 9 ft. 7¼.; light weight 51,900 lb.; load limit 199,100 lb.; capacity—2,283 cu.ft.; 199,000 lb.

Great Northern 75-ton hopper ore car. Builder, American Car and Foundry Div., ACF Industries, Inc.
Light weight 41,500 lb.; capacity 1,262 cu. ft.; inside length 19 ft. 10 in.; width 10 ft. 5 in.; height to top of car 10 ft. 2 in.

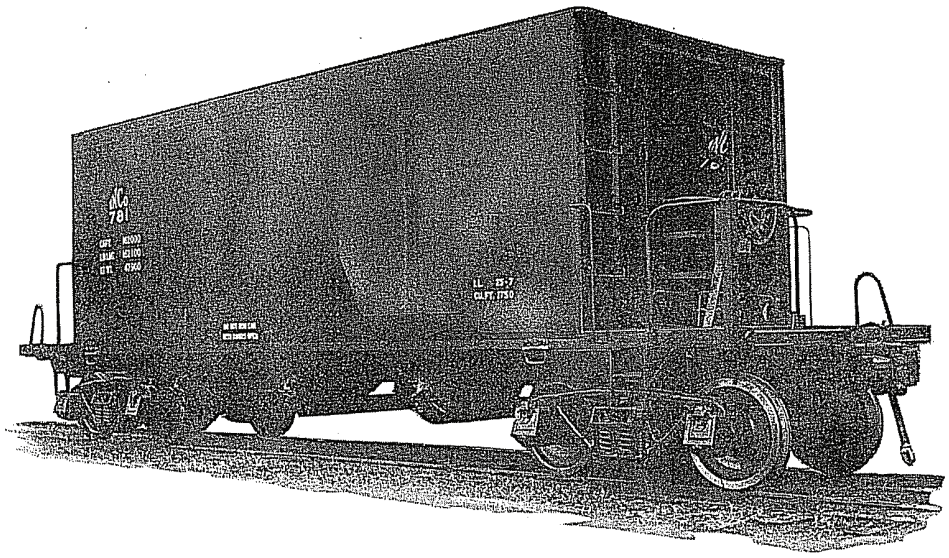
Canadian Car Division A.V. Roe Canada Limited

Canada's largest manufacturer of Railway Rolling Stock and Equipment



75-ton Ore car with cast steel wheels with roller bearings.

Capacity	165,000 lbs.
Load limit	166,200 lbs.
Light weight	43,800 lbs.
Cu. ft.	1,000
Inside length	19 ft. 9⅝ in.
Inside width	10 ft. 5½ in.
Extreme height	10 ft. 2-11/16 in.
Length over strikers	21 ft. 7 in.



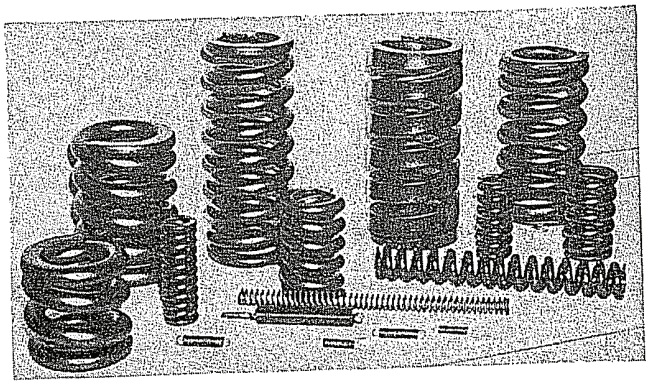
75 ton Triple Hopper Sand Car of welded construction.

Capacity	162,000 lbs.
Capacity	1,750 cu. ft.
Load Limit	162,100 lbs.
Light weight	47,900 lbs.
Length over strikers	36 ft.
Inside width	25 ft. 7⅝ in.
Inside length	9 ft. 11 in.
Extreme height	12 ft. 0-¾ in.

THE ore car, sand car and the springs shown on this page are typical examples of the high quality design, workmanship and materials that go into Canadian Car products.

Springs

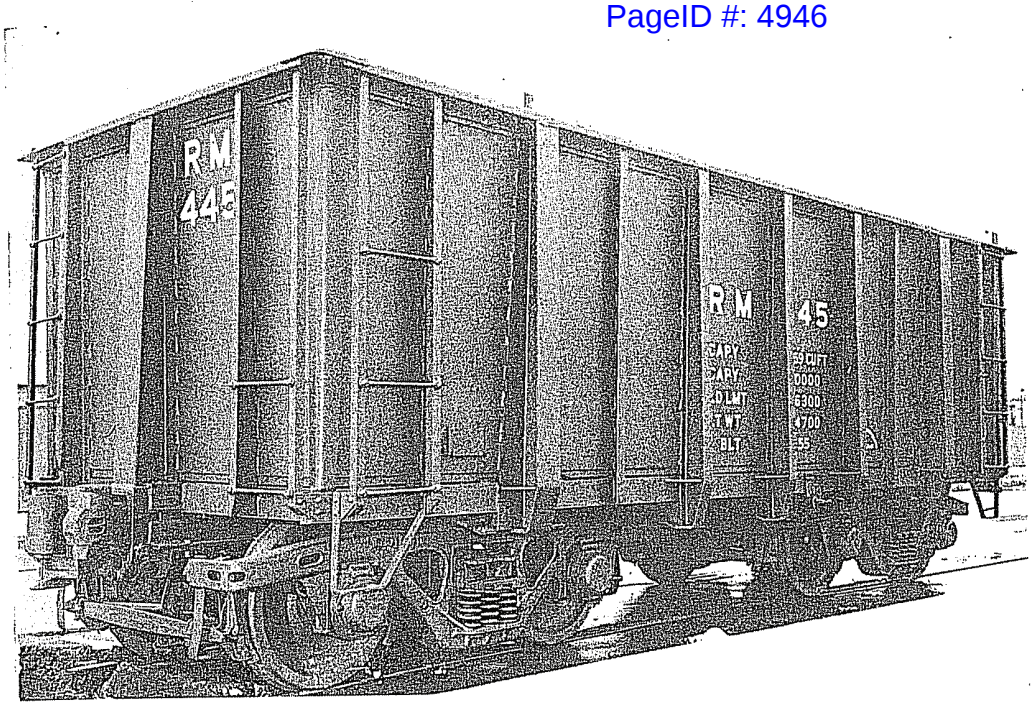
Canadian Car Division, with one of Canada's most modern Spring Shops, is prepared to supply the finest quality Springs to the Transportation industry. The high quality indicative of this Company's products, is incorporated in each and every unit.



Coil Springs

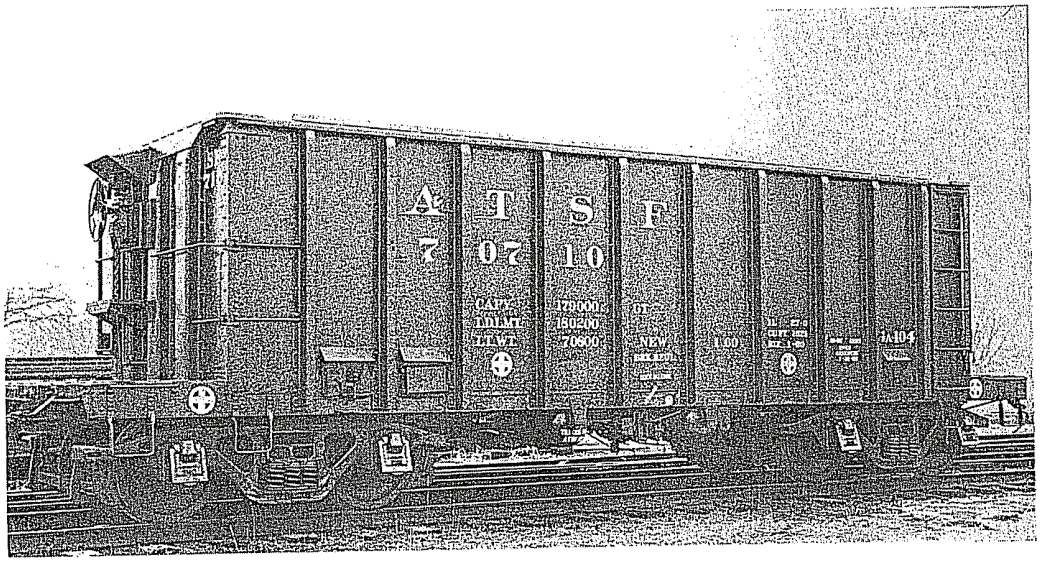
CANADIAN CAR DIVISION A. V. ROE CANADA LIMITED, MONTREAL, QUE., CANADA

Products and Branch Offices Are Listed in the Classified Indexes



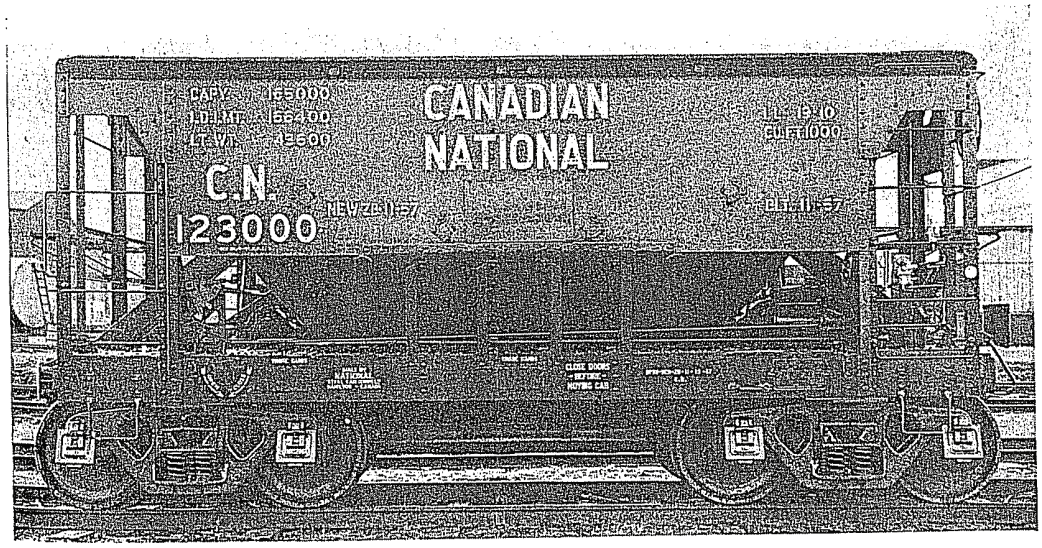
Reserve Mining 95-ton ore car, roller bearing equipped. Builder, American Car and Foundry Div., ACF Industries, Inc.

Inside length at top 25 ft. 8 in., at floor 25 ft. 2¼ in.; width at top 9 ft. 9 in., at floor 9 ft. 3¼ in.; height 6 ft. 6-5/16 in.; light weight 54,700 lb.; load limit 196,300 lb.



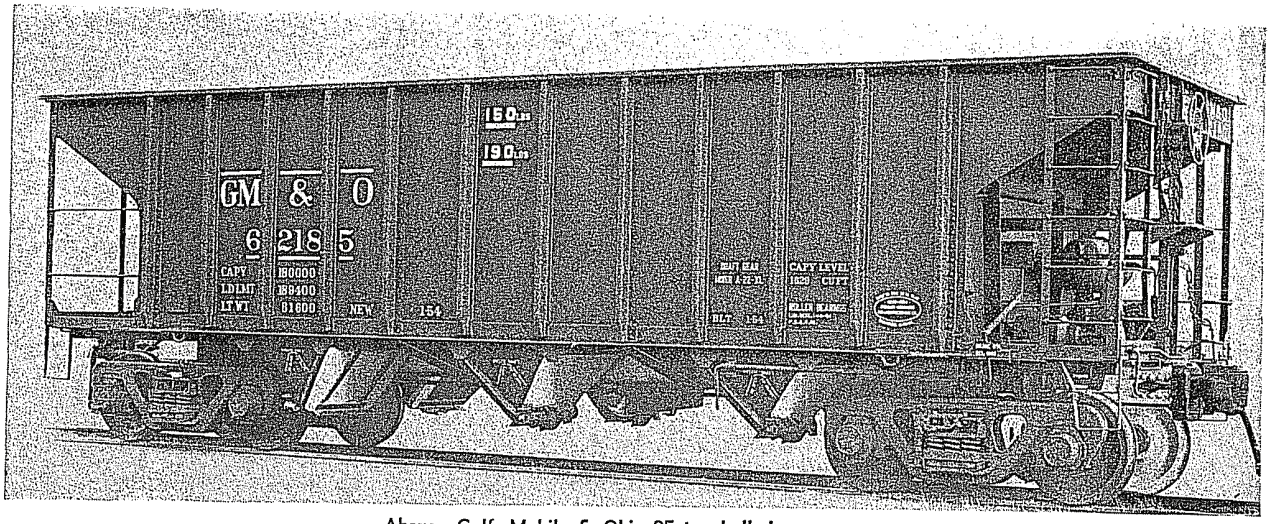
Atchison, Topeka & Santa Fe Class GA-104 solid bottom ore car with one piece cast steel underframe.

Inside length 27 ft. 0 in.; width 9 ft. 3 in.; height 6 ft. 6 in.; capacity 1,621 cu. ft.; light weight 70,800 lb.; load limit 180,200 lb.

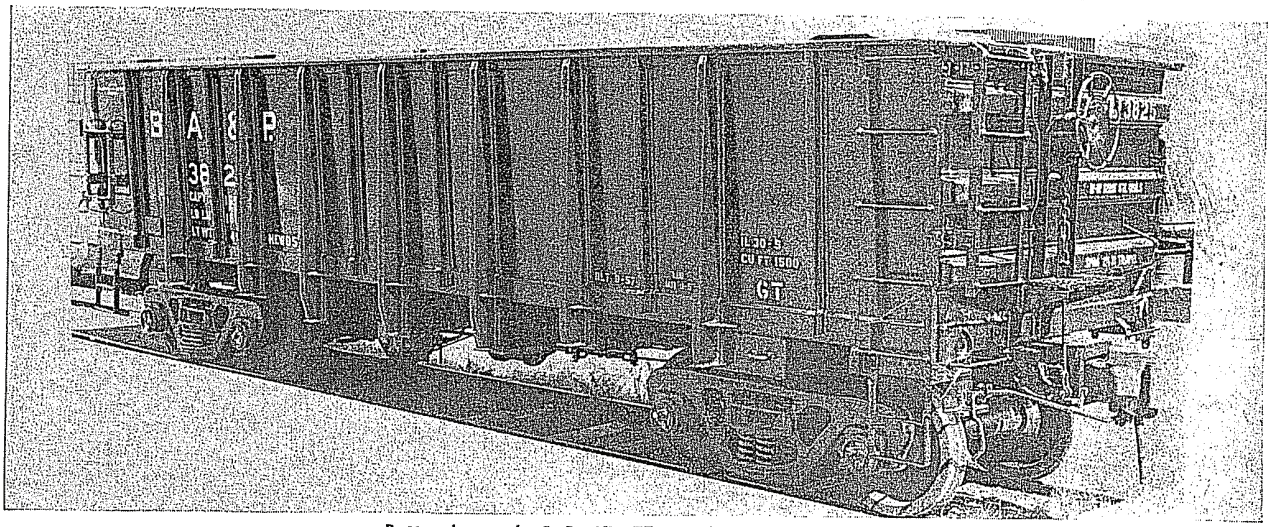


Canadian National 75-ton center dump hopper ore car. Builder, National Steel Car Corporation, Ltd.

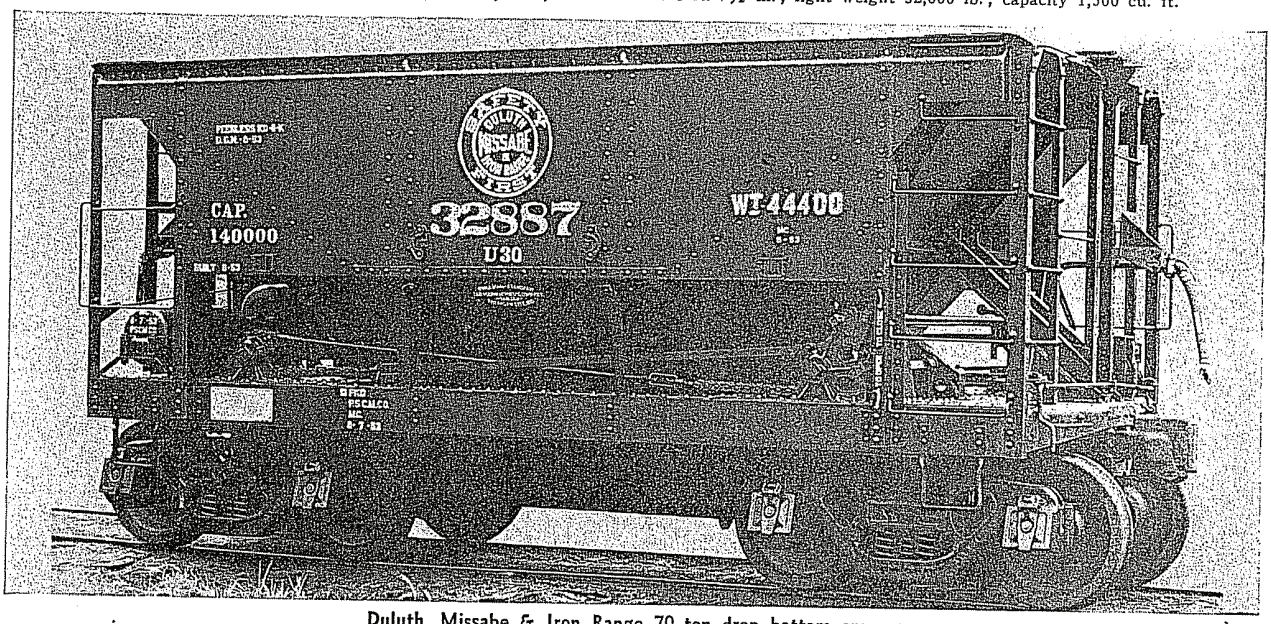
Inside length 19 ft. 10 in.; width 10 ft. 5 in.; capacity 1,000 cu. ft.; light weight 43,600 lb.; load limit 166,400 lb.



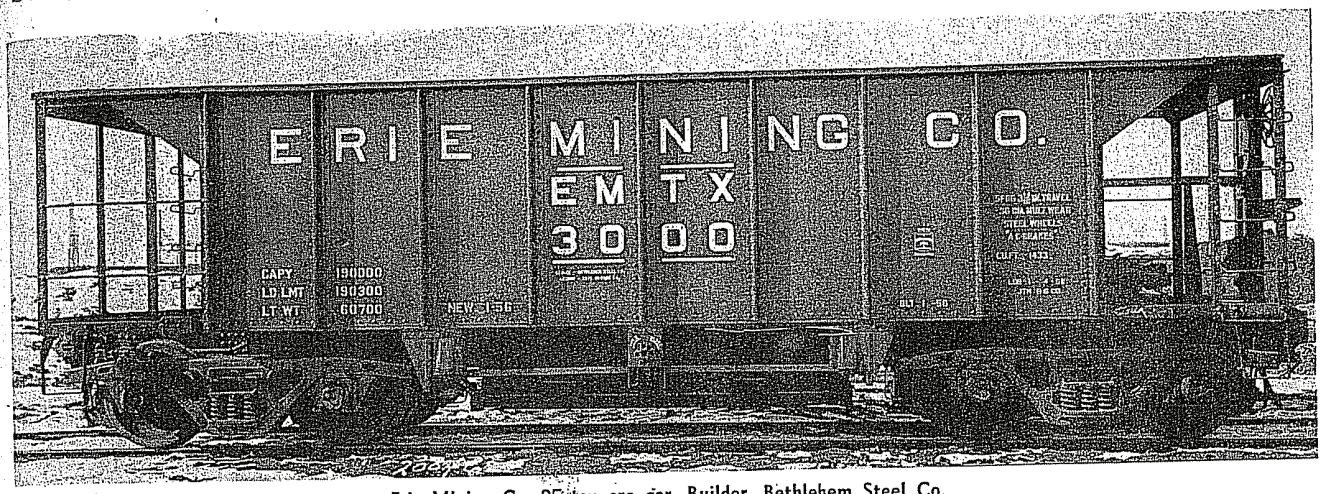
Above—Gulf, Mobile & Ohio 95-ton bulk iron ore car.
Light weight 61,600 lb.; load limit 189,400 lb.; capacity 1,629 cu. ft.; inside length 29 ft. 8 in.; width 9 ft. 8 in.; height 7 ft 2 in.



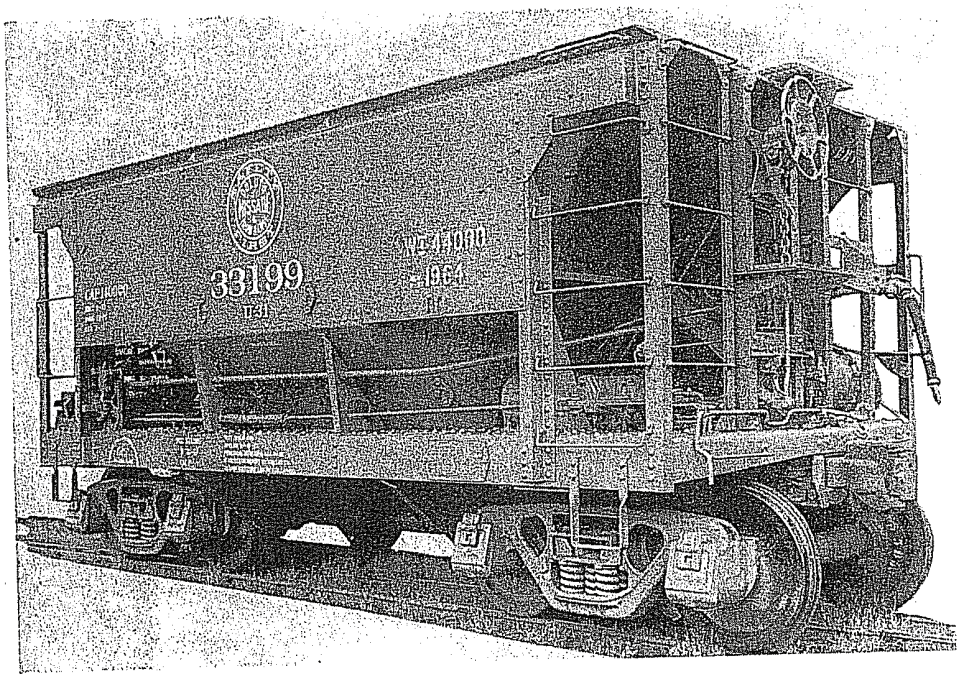
Butte, Anaconda & Pacific 75-ton flat bottom ore car.
Inside length 30 ft. 5 in.; width at top 9 ft. 1½ in.; width at side 8 ft. 7½ in.; light weight 52,000 lb.; capacity 1,500 cu. ft.



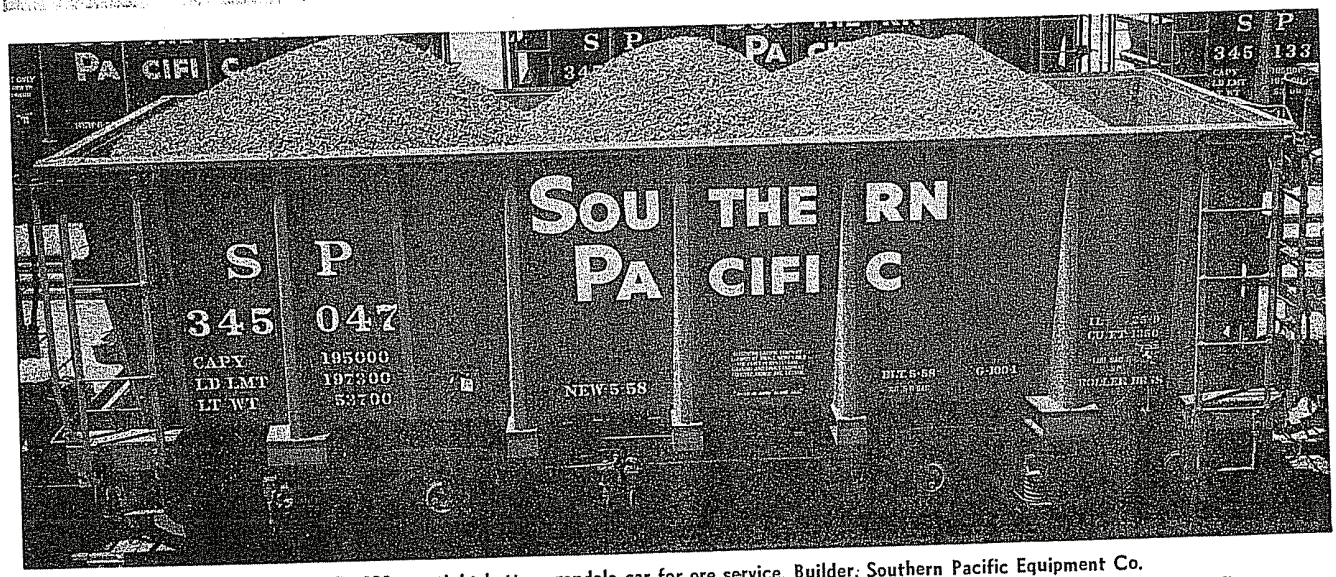
Duluth, Missabe & Iron Range 70-ton drop bottom ore car.
Inside length 19 ft. 10⅞ in.; width 10 ft. 5½ in.; overall height 10 ft. 2 in.; light weight 44,400 lb.; capacity 1,000 cu. ft.; load limit 140,000 lb.



Erie Mining Co. 95-ton ore car. Builder, Bethlehem Steel Co.
Inside length 29 ft. 7 in.; width 9 ft. 10 in.; capacity 1,433 cu. ft.; light weight 60,700 lb.; load limit 190,300 lb.



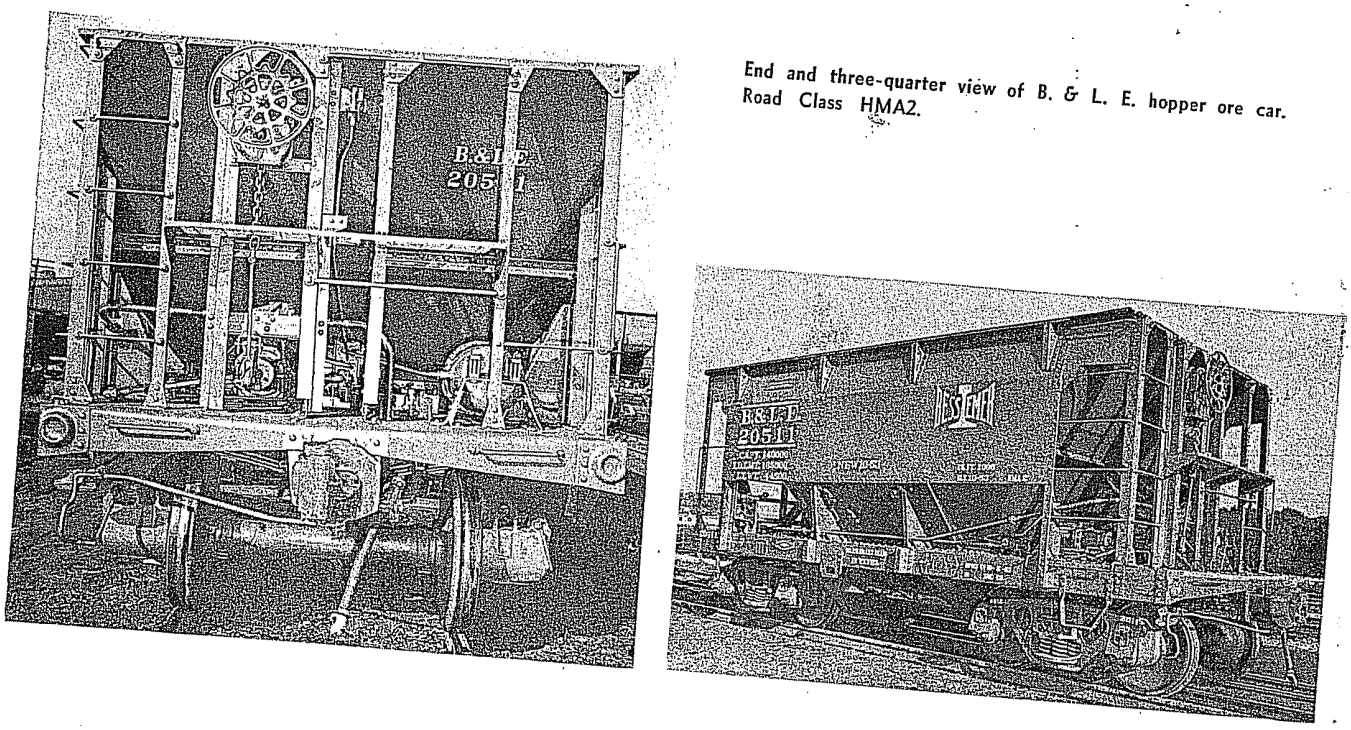
Duluth, Missabe & Iron Range 70-ton ore car. Builder, American Car and Foundry Div., ACF Industries, Inc.
Inside length 19 ft. 10 in.; width 10 ft. 5 in.; capacity 1,000 cu. ft.



Southern Pacific 100-ton tight bottom gondola car for ore service. Builder, Southern Pacific Equipment Co.
Inside length 25 ft. 9⅜ in.; width 9 ft. 9⅛ in.; height 6 ft. 1½ in.; capacity 1,350 cu. ft.; light weight 53,700 lb.; load limit 197,300 lb.

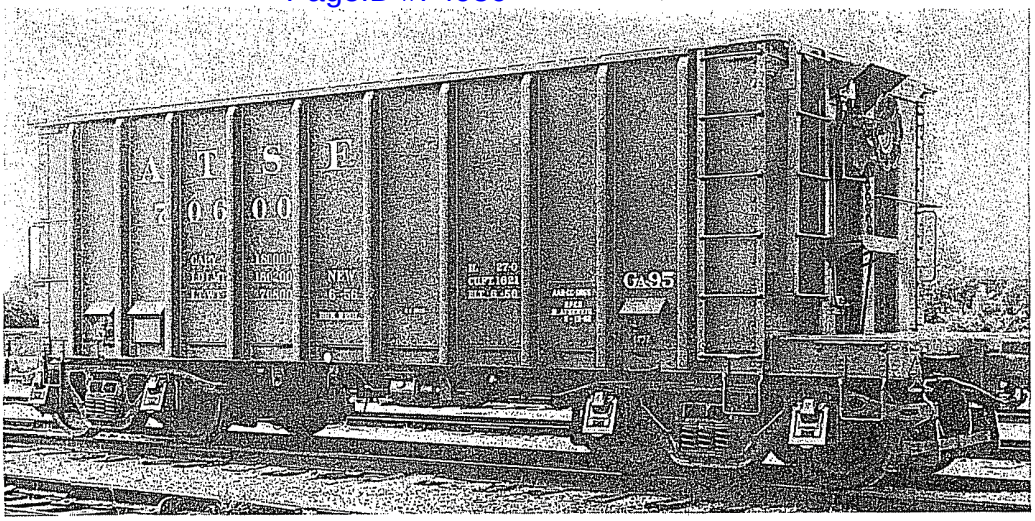
Bessemer & Lake Erie 70-ton hopper ore car, Road Class HMA1.

Length, inside at top	20 ft. 9 in.	Capacity	1,096 cu. ft.
Length over striking plate	24 ft. 8 in.	Capacity	140,000 lb.
Length, coupled	27 ft. 2 in.	Load limit	166,000 lb.
Width, outside	10 ft. 6 in.	Light weight	44,000 lb.
Height, from rail to top of car	10 ft. 8 in.	Slope, floor	50 deg.



End and three-quarter view of B. & L. E. hopper ore car. Road Class HMA2.

Greenville Steel Car Co.

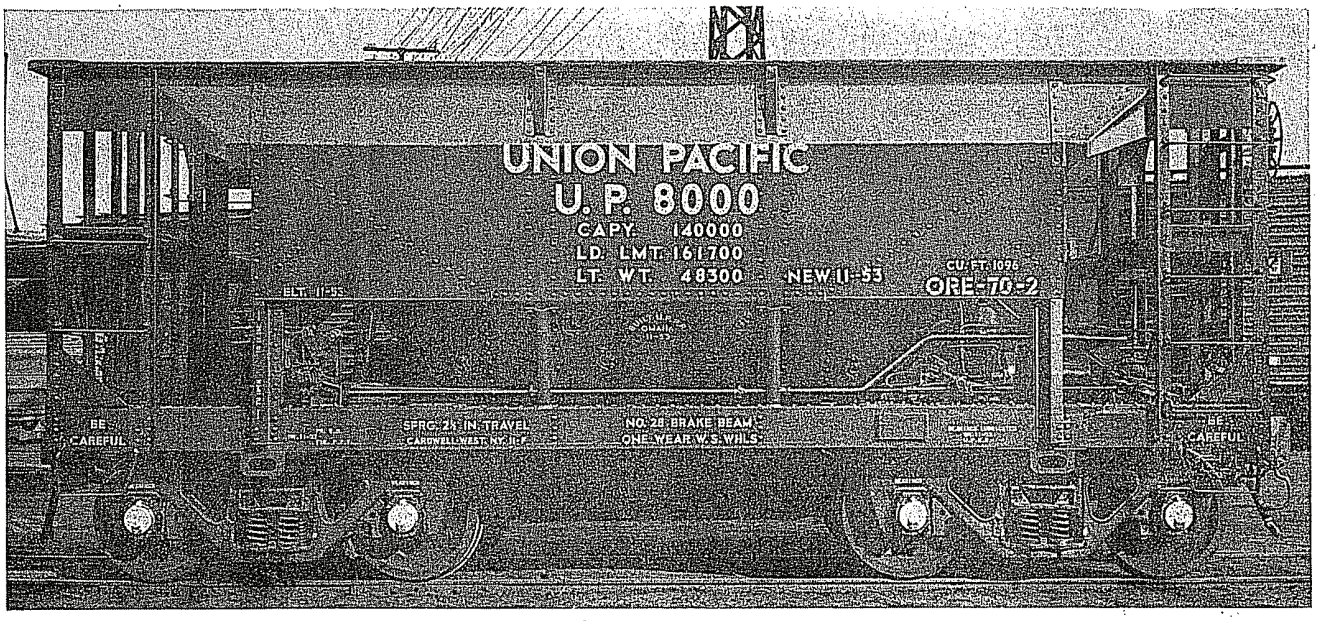


Atchison, Topeka & Santa Fe 90-ton solid bottom ore car with General Steel one piece cast steel underframe.

Inside length 27 ft. 0 in.; width 9 ft. 3 in.; height 6 ft. 6 in.; capacity 1,623 cu. ft.; light weight 70,800 lb.; load limit 180,200 lb.

Canadian National 82½-ton center dump hopper ore car. Builder, National Steel Car Corporation, Ltd.

Inside length 19 ft. 10 in.; width 10 ft. 5 in.; capacity 1,000 cu. ft.; light weight 43,000 lb.; load limit 167,000 lb.



Union Pacific 70-ton hopper ore car. Built in Company shops at Omaha, Neb.

Light weight 48,300 lb.; load limit 161,700 lb.; capacity 1,096 cu. ft.; inside length 20 ft. 9 in.; width 10 ft. 5 in.

1966

Car and Locomotive Cyclopedia

Of American Practice

Definitions and Illustrations of Railroad Cars and Locomotives and their Components built for Domestic and Export Service, and including Shop Practices and Electrical Fundamentals.

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Section 1

Dictionary of Car and Locomotive Terms

Used in Railway Practice

See the Lead Pages of Sections 3, 5, 6 and 7 for the Classification and Description of Each Type of Car.

A

"A" End of Car. The end opposite that on which the hand brake is mounted. See "B" End of Car.

"A" Unit. A Diesel unit equipped with a cab and operating controls. Also called Lead Unit.

Accordion Hood. A term sometimes applied to the top transverse portion of a vestibule diaphragm. See Diaphragm.

Air Brake. In its widest sense, the term "Air Brake" may include any system of braking in which the mechanism is actuated by the manipulation of air pressures exerted on different parts of the apparatus. A more restricted meaning of term is general in the United States and covers only brakes which employ air under pressures above atmospheric as distinguished from "Vacuum Brakes" which employ pressures below atmospheric. With train speeds of the order of 90 m. p. h. and above in passenger service, and 50 to 70 m. p. h. in freight service, the conditions under which the air brakes must function have become more exacting and the equipment correspondingly intricate. See Section 13 for details covering the latest American practices. For definitions of current air brakes schedules see AB BRAKE, AC BRAKE VALVE, AUTOMATIC AIR BRAKE, AUTOMATIC EMPTY-AND-LOAD BRAKE, ELECTRO-PNEUMATIC STRAIGHT AIR BRAKE, PC BRAKE EQUIPMENT, UC PASSENGER-CAR BRAKE and '26 BRAKE EQUIPMENT.

AB Brake. The current standard freight-car brake. The car equipment consists of the AB valve, a brake cylinder, auxiliary and emergency reservoirs combined in a single unit, a combined dust collector and cut-out cock, and a retaining valve. Its functions are high-speed serial action in service applications effective through a train of 150 cars, effective cylinder pressures throughout the train with light brake-pipe reductions, assured release, uniform recharge, emergency always available after application or release, controlled emergency which prevents severe shocks, and quicker and more positive release after emergency than with previous freight brake schedules. See Section 13

AB Brake Valve. The operating valve of the AB freight-car brake. It has three portions: service, emergency and pipe bracket. It charges, applies and releases the brakes.

A B D Brake Valve. A modification of the A B Valve effected by the substitution of diaphram—operated pistons, and O-ring spool valves in the service and emergency portions which cause its performance to be similar to that of the A C Valve. The change over also includes accelerated service release and an integral brake-cylinder release valve on the service portion. See Sec. 13

Adjusting Spring. A heavy spiral spring or nest of springs used for controlling the side motion of a two-wheel radial trailing truck. Also called centering spring.

Also used for moving four-wheeled trucks back to the central position when they have been displaced by passage over a curve.

Used to bring the coupler or drawbar back to central position after passing over a curve.

Used on a brake head to hold the brake shoe in its proper position. See Brake Head Adjusting Spring.

Aftercooler. A radiator unit for cooling the compressed air of the air brake system. See Cooling Coil.

AC Brake Valve. A freight car brake operating valve which performs essentially the same functions as the AB brake valve and operates in entire harmony with it but provides a very rapid serial release action not provided by the AB valve. Simpler in design and lighter in weight.

Air Brake Hose. Armored or otherwise reinforced tubing which is attached to a nipple that screws into the angle cock at the end of the brake pipe. The other end of the hose is fitted with a coupling which engages with a similar coupling on the adjoining car. The complete arrangement forms a flexible air connection between the brake pipes of cars or locomotives. Manual, Sec. A.

Air Brake Hose Clamp. See Hose Clamp.

Air Brake Hose Coupling. A special type of standardized fitting which is attached to one end of an air brake hose in order to provide means for connection and disconnection, quickly and securely, of the hoses by which the air brake pipe and also signal pipe are carried from car to car. Manual Sec. E.

Air Brake Hose Coupling Gasket. A rubber-composition gasket which fits into the air brake hose coupling to seal the connection against air leakage. This gasket is of standard A. A. R. design and must meet standard specifications of the Association. Manual Sec. A and E.

Air Brake Hose Label. A label of red or white rubber vulcanized to the air-brake hose near one end. On the label is branded the initials or name of the railroad or other purchaser; the name of the manu-

Elliptic Spring. A spring whose shape resembles an ellipse. Made of two sets of parallel steel plates, called leaves, of constantly decreasing length. Such springs are generally used for bolster springs for passenger cars.

The set of elliptic springs is the total amount of bend or compression of which the spring is capable. Elliptic springs in service are termed double or duplicate, triplets or triplicate, quadruple, quintuple, sextuple, etc., according to the number of springs used side by side and connected, so as to constitute practically one spring.

Emergency Application. The type of brake application made when a train must be stopped in the minimum distance possible for the equipment. It may be made from a Conductor's Valve or on a car, from a "Back-up Valve," or from the Engineer's Brake Valve on the locomotive or power car. An emergency application may also occur when a brake pipe is broken, or when air hoses between cars are disconnected with angle cocks open. In any event an emergency application is brought about by inexhausting of air pressure from the brake pipe.

Emergency Brake Valve. A valve for applying the train brakes in emergency which is placed at some convenient point in each passenger-train car. It is connected to the brake pipe by a branch pipe and operated by releasing brake-pipe air to the atmosphere. Long known as the Conductor's Valve.

Emergency Coupler Knuckle. A knuckle which is designed for use in case of damage to the knuckle of automatic couplers.

Emergency Coupling Device. A short shank coupler which can be chained in place if the standard coupler is pulled out or broken.

Emergency Head Back-Up Connection. A device for application to an automatic connector in order that a back-up cock, brake or signal hose may be coupled to it.

Emergency Reservoir. A part of the car equipment of the AB freight brake system and the D-22-P passenger brake system to provide quick recharge, graduated release and high emergency cylinder pressure. It supplements the supply from the auxiliary reservoir.

Emergency Tool Box. A container carrying a hammer, axe, chisel, bar and other tools to be used in case of a wreck.

Empty and Load Brake Equipment (Freight). A double-capacity brake equipment used on cars which move empty or fully loaded. The changeover may be manual or automatic.

Empty-and-Load Valve. An operating valve for a double-capacity brake used on cars that operate empty or fully loaded.

End Belt Rail. See BELT RAIL.

End Brace. See BRACE.

End Door. A door in the end of a car.

In some box cars this door, when used, is small and generally about half way up to the roof. It is used for loading and unloading long material, which cannot be handled through the side door. Sometimes called lumber door.

On some automobile cars one end of the car is arranged in the form of a double swing door.

The term is used in connection with passenger cars to differentiate from the vestibule side door.

End Frame. The frame which forms the end of a car body. It includes the posts, braces, belt rail and end plate.

End Loading. See CIRCUS LOADING.

End Panel. A panel at the end and on the outside of a passenger equipment car below the window.

End Plate. A member across the end and connecting the tops of the end posts of a car body and fastened at the ends to the two side plates. It is usually made of the proper form to serve as an end carline.

End Play (Axle). The movement, or space left for movement between journals. (Truck bolster.) Usually called lateral motion.

End Post. The vertical members in the end body framing between the corner posts.

(Hopper Car.) A vertical support for the overhang of the hopper floor, resting on the end sill.

End Rail. See WAINSCOT RAILS.

End Sheet. A plate used in closing the end of a steel car.

End Sill. The transverse member of the underframe of a car, extending across the ends of all the longitudinal sills. In steel underframe cars a rolled or cast section, or a pressed plate. In passenger cars the end sill comes directly under the end door. The platform, with its various parts, may be a separate construction or an integral part of the complete end construction.

End Sill Brackets (Steel-Frame Cars). Angle plates used to connect the longitudinal sills and the end sill. In bridge building such plates are termed brackets. When of triangular section they are termed gussets.

End Sill Diagonal Brace. A horizontal brace extending from the end sill diagonally back to or beyond the bolster.

End Sill Plate. A plate extending the full length and width of a built-up end sill, and attached to the other members.

End Slope. The sloping floor from the end of a hopper car to the hopper door. See HOPPER SLOPE SHEET.

End Top Angle. On open-top cars the end sheets are usually reinforced by this member which corresponds to the end plate on closed cars.

End Train-Pipe Valve (Steam Heating). A valve in the train steam pipe at the end of the car by which the entire car may be cut out. Usually operated by an extension handle extending up to the platform or out to the side of the car.

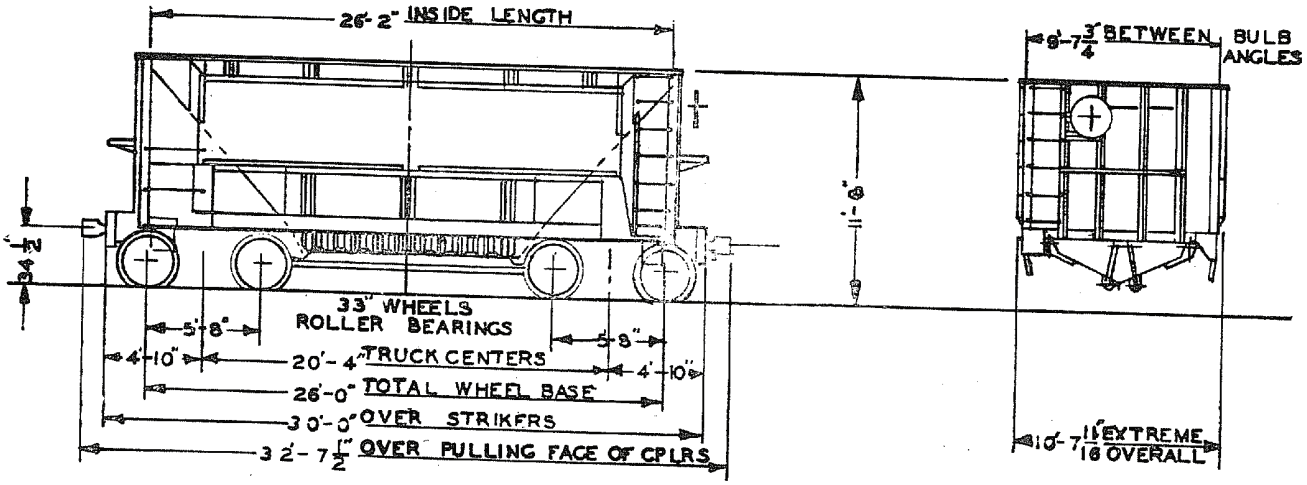
End Ventilator. An aperture for the admission or escape of air at the end of a car. See VENTILATOR.

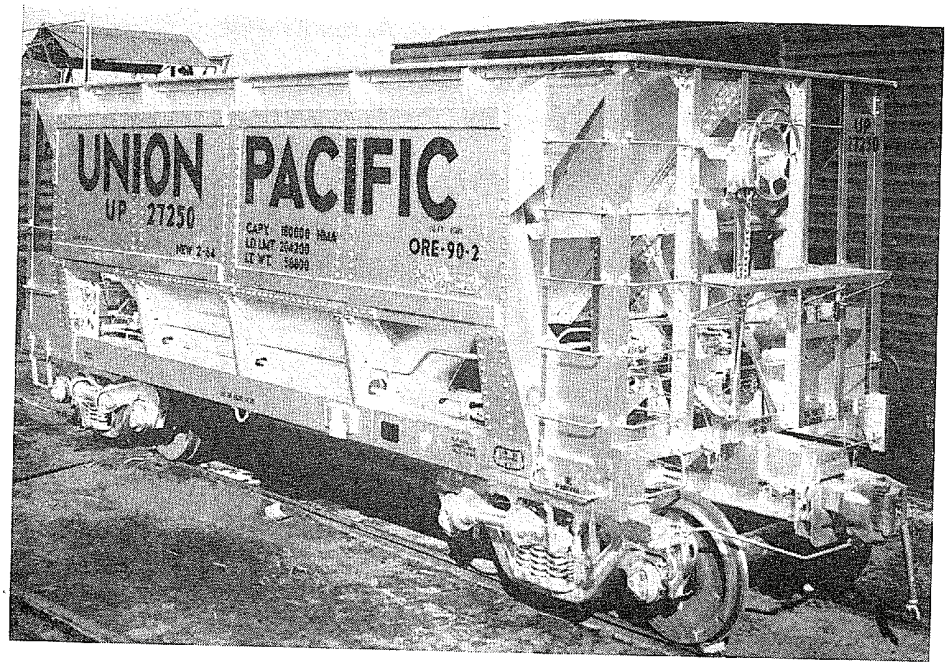
End Window Panel. A panel at the end and on the outside of a passenger car alongside the window, in distinction from the end panel proper, which is below the window. See PANEL.

Engine. A mechanism for converting the energy in steam, air or other gas under pressure into mechanical energy in the form of motion. Usually restricted to reciprocating engines having a cylinder, reciprocating piston and means for causing the gas under pressure to expand alternately on one or both sides of the piston and move it back and forth in the cylinder. The term includes also the means of transforming the reciprocating motion of the piston into rotary motion, consisting usually of a connecting rod and crank. Frequently used as meaning the entire locomotive. See also INTERNAL COMBUSTION ENGINE.

Canadian National 90-ton ore car, four wheels 6½-in. x 12-in trucks anti-friction-type bearing standard gauge. Built by Marine Industries Limited.

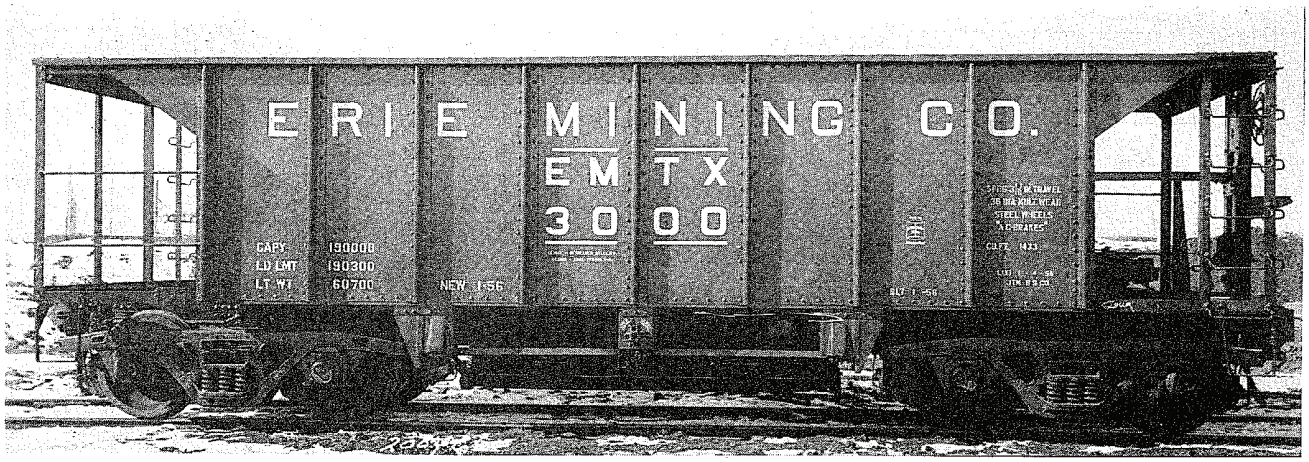
Inside length 36 ft. 10 in.; width 10 ft. 5 in.; height 7 ft. 0 in.; capacity 1,600 cu. ft.; light weight 51,400 lb.



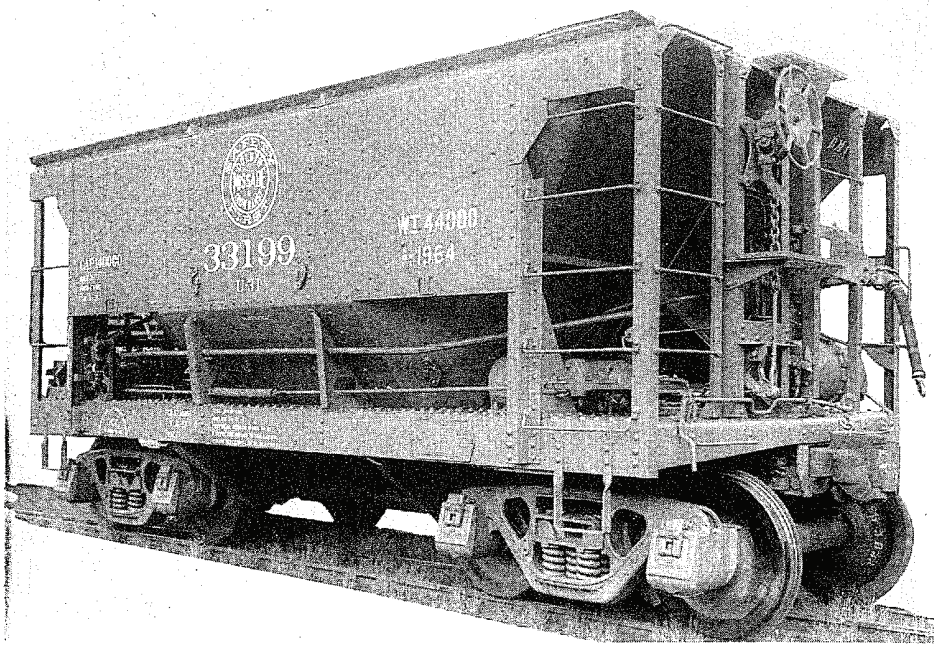


Union Pacific 90-ton ore car. Built by the railroad.

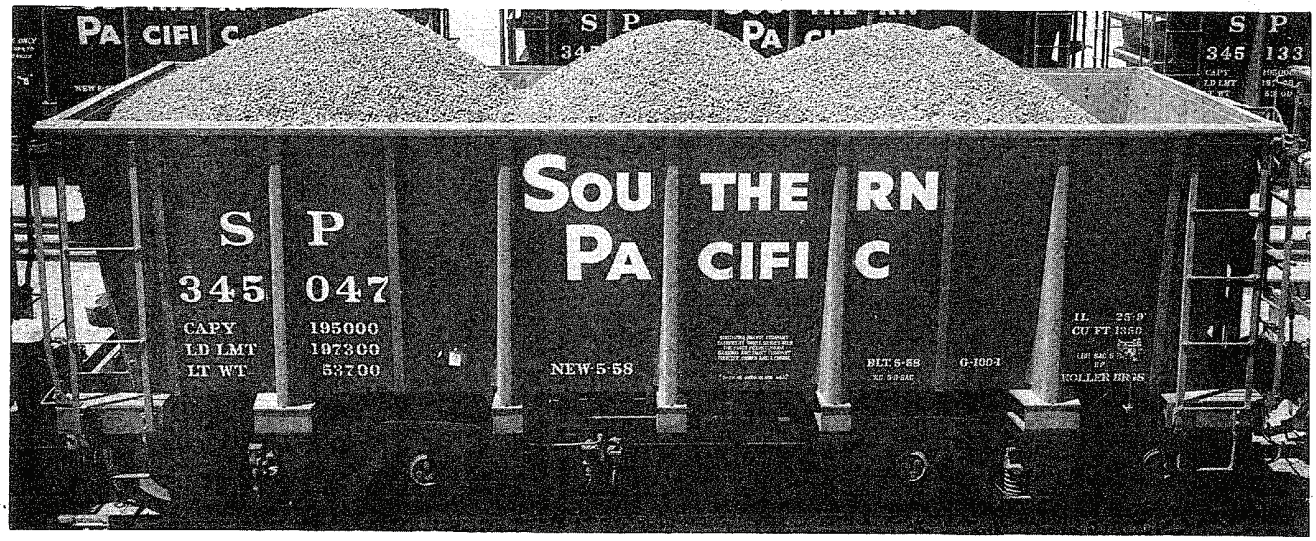
Inside length 26 ft. 2 in.; width 10 ft. 5 in.; capacity 1,580 cu. ft.; light weight 58,800 lb.; load limit 204,200 lb., capacity 1,580 cu. ft.; light weight 58,800 lb.; load limit 204,200 lb.



Erie Mining Co. 95-ton ore car. Builder, Bethlehem Steel Co.
Inside length 29 ft. 7 in.; width 9 ft. 10 in.; capacity 1,433 cu. ft.; light weight 60,700 lb.; load limit 190,300 lb.

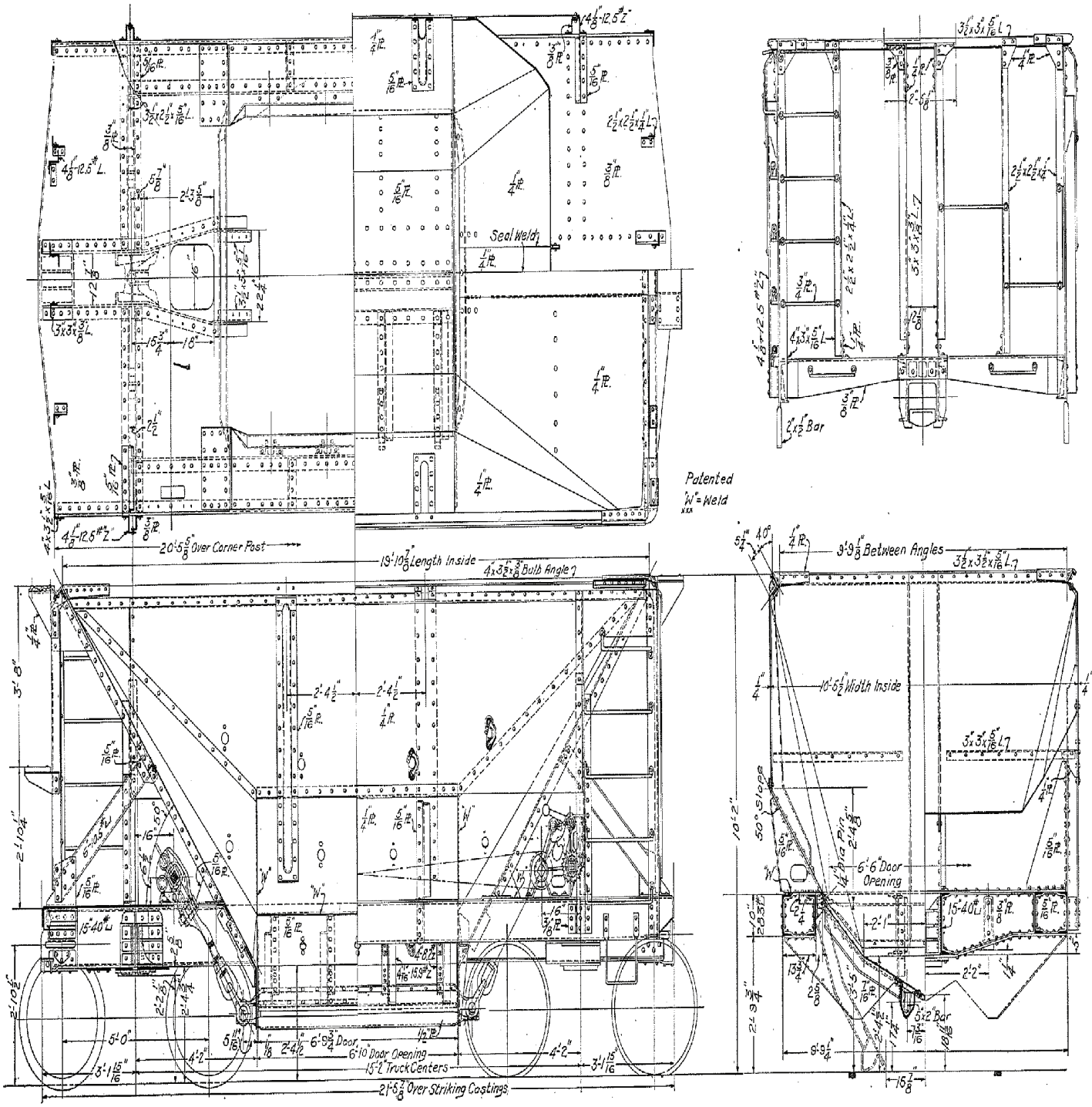


Duluth, Missabe & Iron Range 70-ton ore car. Builder, American Car and Foundry Div., ACF Industries, Inc.
Inside length 19 ft. 10⅞ in.; width 10 ft. 5 in.; capacity 1,000 cu. ft.



Southern Pacific 100-ton tight bottom gondola car for ore service. Builder, Southern Pacific Equipment Co.
Inside length 25 ft. 9⅜ in.; width 9 ft. 9⅛ in.; height 6 ft. 1½ in.; capacity 1,350 cu. ft.; light weight 53,700 lb.; load limit 197,300 lb.

051 ARL

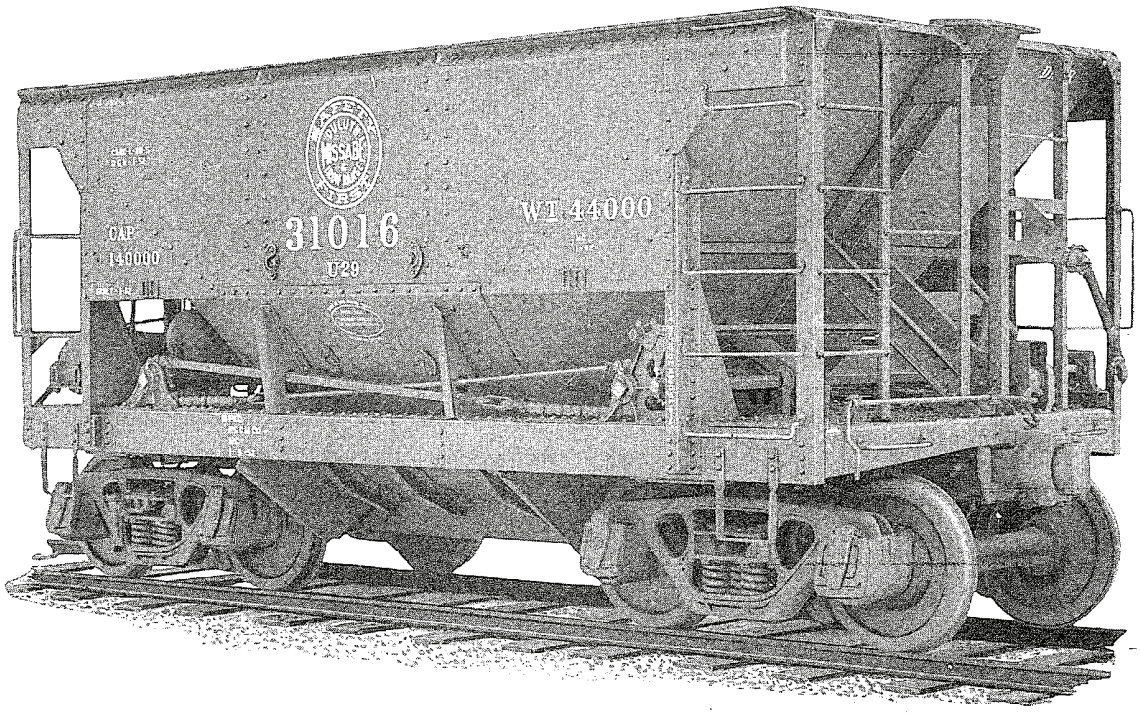


Enterprise equipped hopper iron ore cars, center discharge.

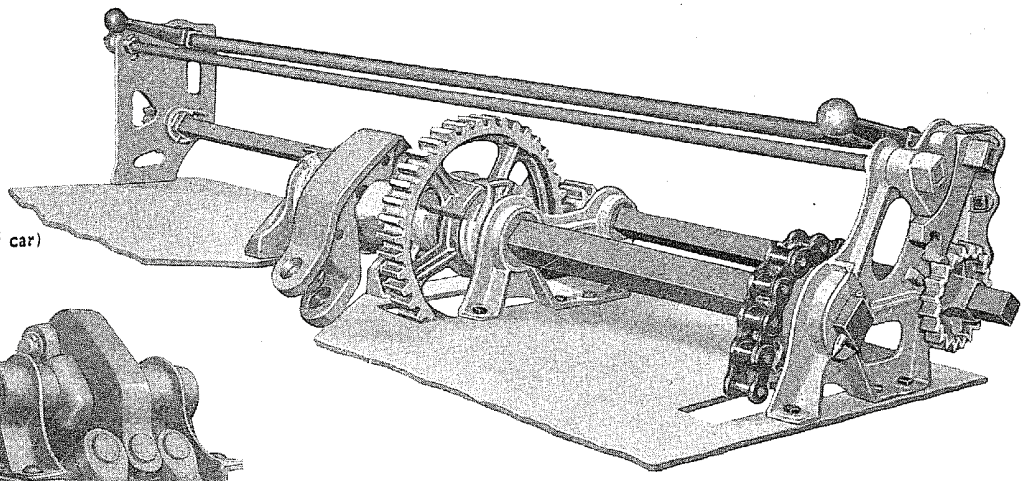
Enterprise Railway Equipment Company

(See also opposite page)

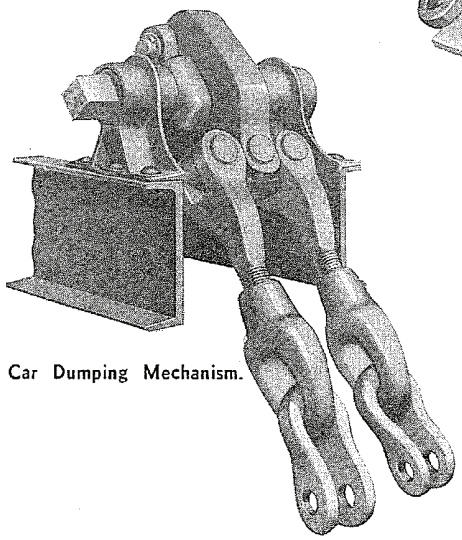
Enterprise Door Operating Mechanism for Ore Cars



Center Discharge Ore Car.



Enterprise Door Latch and Operating Mechanism (Operative from either side of car)



Enterprise Ore Car Dumping Mechanism.

THE 70-ton Hopper Ore Car shown above illustrates the center discharge car commonly used in iron ore service. Steep floors, rounded corners and large door openings insure quick and free discharge of the load. The door opening is closed by a pair of longitudinally hinged doors which are controlled by the Enterprise Door Mechanism, which is operative from either side of the car and securely locks the doors when in closed position. For illustration see page 194.

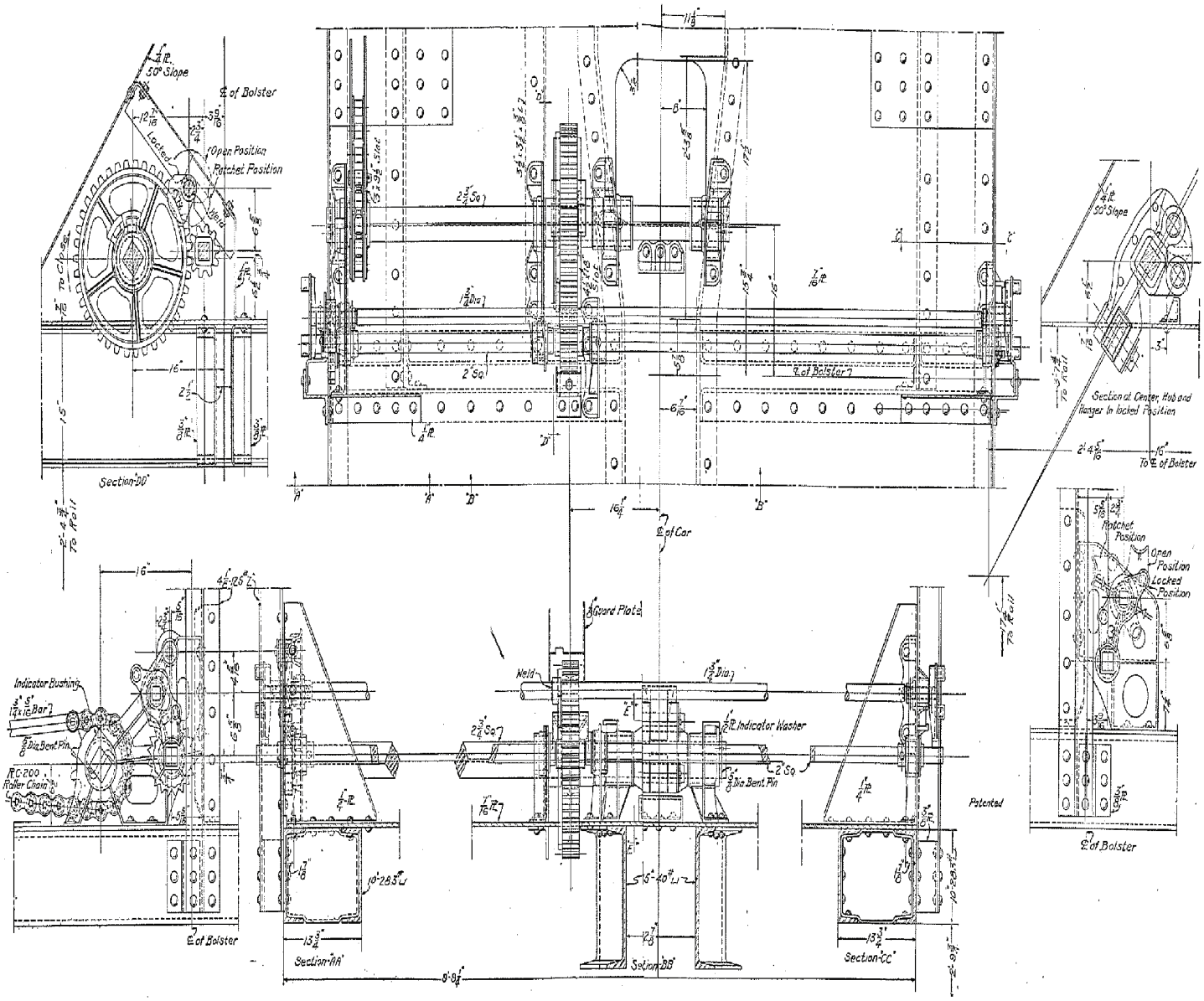
Blueprints and information on Enterprise side discharge ore car mechanisms are also available.

ENTERPRISE RAILWAY EQUIPMENT COMPANY

Headquarters: 8754 S. Dobson Avenue / Chicago, Illinois 60619, U.S.A. / Area Code 312, Phone 221-4800

Office of International Operations: 1212 Pennsylvania Building / 425 Thirteenth St., N.W. / Washington, D.C., 20004, U.S.A. / Cable: Enterco Washington, D.C., TWX 710-822-9362

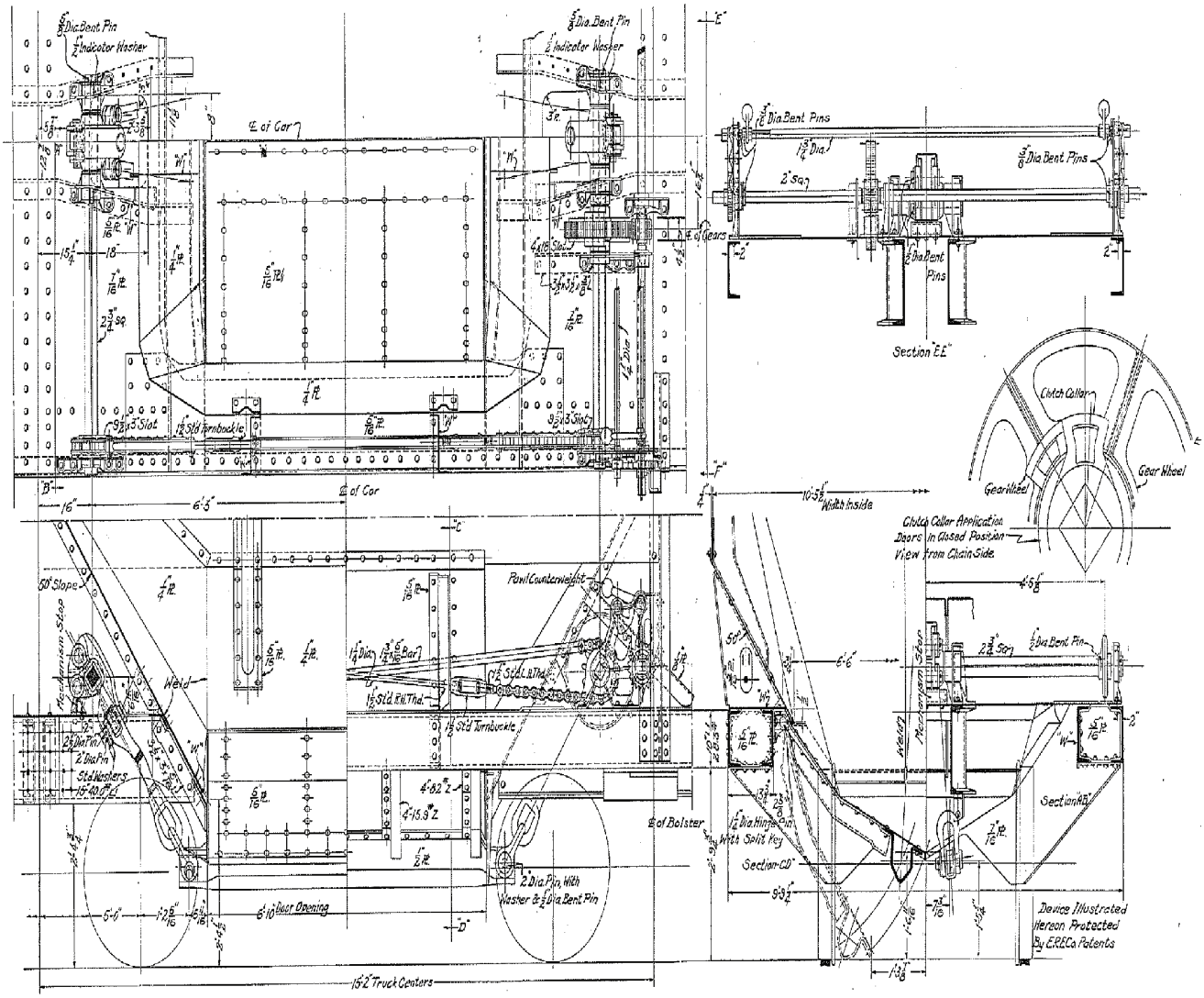
Products and Branch Offices Are Listed in the Classified Indexes



Safety Door Operating Mechanism for ore car.

Enterprise Railway Equipment Company.

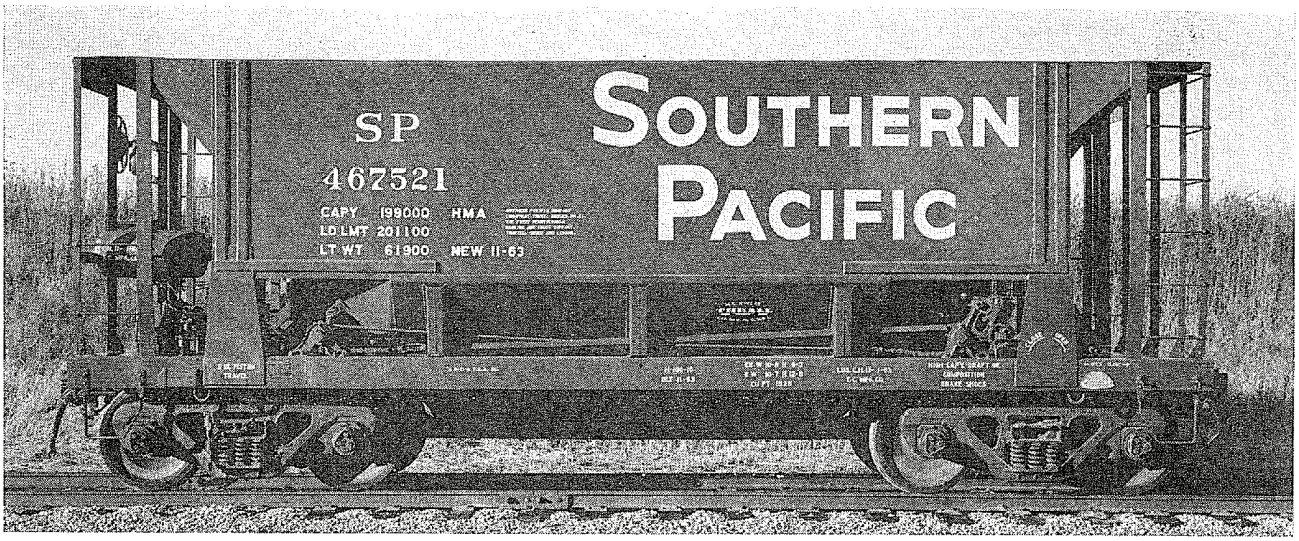
(See also Pages 194, 195 and 197)



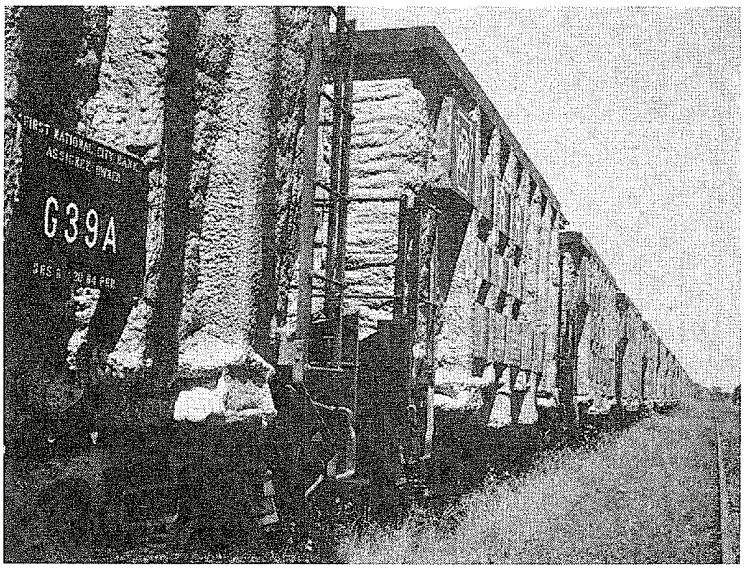
Standard Door Operating Mechanism for center discharge ore car.

Enterprise Railway Equipment Company

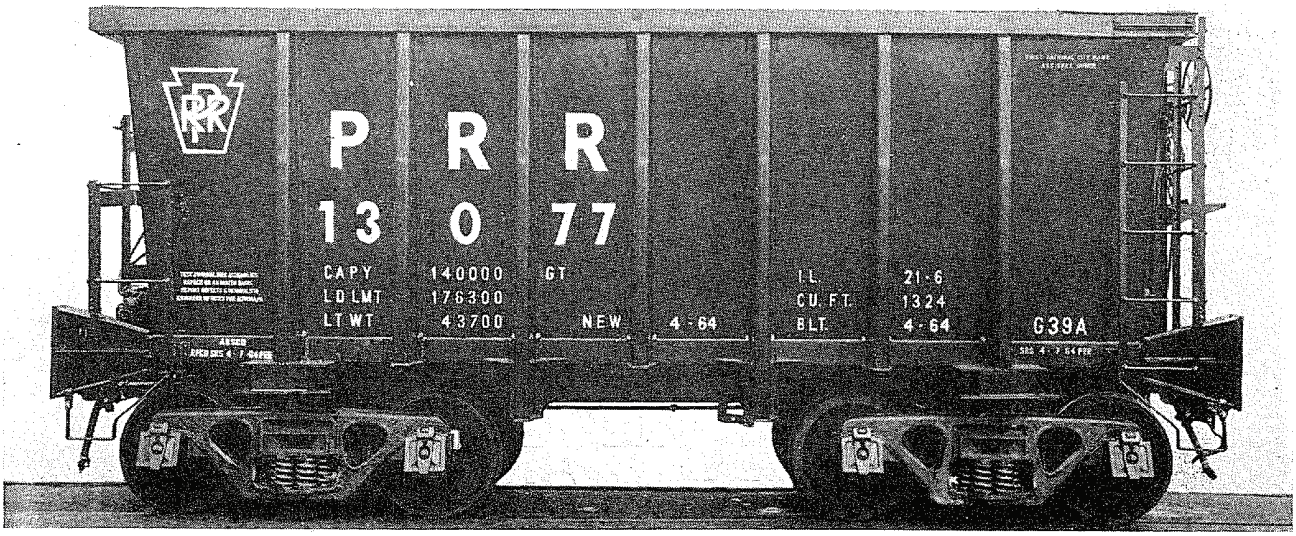
(See also Pages 194, 195 and 196)



Southern Pacific 100-ton 27-ft. 6-in. drop bottom ore car specially designed for handling copper concentrate. Car is equipped for pneumatic door operation. Built by Thrall Car Mfg. Company.
Inside length 27 ft. 6 in.; width 10 ft. 5 in.; capacity 1,825 cu. ft.; light weight 61,900 lb.; load limit 201,100 lb.



Pennsylvania Railroad 70-ton foam insulated ore jenny. Built by the railroad. This is the same car as shown below except for the foam insulation which adds about 500 lb to the car's light weight.



Pennsylvania Railroad 70-ton 22 ft. ore car with 6-in. slope. Built by the Railroad in their Samuel Rea Shop.
Inside length 22 ft. at top with 6 in. slope; width 9 ft.; height 7 ft. 2 in.; capacity 1,324 cu. ft.; light weight 43,700 lb.; load limit 176,300 lb.

Attorney's Docket NSC 484

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re: Patent Application of: Confirmation No.: 3873

Title:	Railroad Gondola Car Structure and Mechanism Therefor
Inventor:	James W. Forbes et al.
Assignee:	National Steel Car Ltd.
Filed:	June 16, 2010
Serial No:	12/816,660
Art Unit:	3617
Examiner:	Smith, Jason C.,

To: Mail Stop Amendment
The Honorable Commissioner of Patents and Trademarks
P.O. Box 1450
Alexandria, VA 22313-1450

REQUEST FOR CONTINUED EXAMINATION
AND RESPONSE TO OFFICE ACTION

Sir:

This letter is a Request for Continued Examination, and is responsive to the Official Action dated May 13, 2011, and is filed contemporaneously with a petition under 37 CFR 1.136(a) for a two-month extension of time extending the date for timely response until October 13, 2011. Please amend the above-identified application as follows:

Amendments to the Specification – None at this time.

Amendments to the Claims begin on page 2 of this paper.

Amendments to the Drawings – None at this time.

Remarks begin on page 16 of this paper.

Please charge any additional fees or fee deficiency required by this paper to Deposit Account 15-0450.

Amendments to the Claims

The following listing of claims supersedes all previous listings of claims in this matter.

1 – 4. (Cancelled)

5. (Currently Amended) The railroad hopper car of claim [[2]] 6 wherein said bolster has first and second laterally outboard distal ends, and said hopper car has corner posts extending upwardly from said distal ends of said hopper to said first end slope sheet.

6. (Currently Amended) A railroad hopper car for carrying particulate material, said hopper car comprising:

a hopper;

first and second end sections for carriage by respective first and second rail road car trucks for rolling motion along railroad tracks in a longitudinal direction;

said hopper being suspended between said first and second end sections, said hopper having a discharge section through which to release lading, and first and second end slope sheets oriented toward said first and second end sections, said end slope sheets being inclined in the longitudinal direction to feed said discharge section;

said first end section including a draft sill extending in the longitudinal direction, a main bolster extending cross-wise to said draft sill, and a shear plate mounted to said draft sill and to said main bolster, said shear plate extending lengthwise along said draft sill and cross-wise from side to side of said hopper car;

said first end slope sheet of said hopper over hanging said shear plate of said first end section; and

said hopper car being free of primary structure directly above said shear plate of said first end section under said overhang of said first end slope sheet of said hopper;

~~The railroad hopper car of claim 1 wherein:~~

one of:

(a) said first end slope sheet has an upper margin and said hopper car includes an end post extending upwardly from said draft sill to said upper margin of said first end slope sheet; and

(b) said first end slope sheet has an upper margin terminating at an end wall, and said hopper car includes an end post extending upwardly from draft stub sill to said end wall;

said shear plate has a longitudinally outboard margin and said draft sill has a striker located outboard of said longitudinally outboard margin of said shear plate, and said end post is one of:

(a) rooted to said draft sill adjacent to said striker;

(b) rooted to said shear plate adjacent to said longitudinally outboard margin of said shear plate;

said bolster has first and second laterally outboard distal ends, and said hopper car has corner posts extending upwardly from said distal ends of said ~~hopper~~ bolster to said first end slope sheet; and

said hopper car has a machinery space bounded by (a) said first end slope sheet; (b) said shear plate of said first end section; (c) said end post; and (d) said corner posts, and said machinery space is free of any other primary structure.

7. (Original) The railroad hopper car of claim 6 wherein:

said hopper car has at least one longitudinally hinged discharge door, said discharge door being movable cross-wise between open and closed positions; and

a longitudinally acting pneumatic actuator is at least partially lodged in said machinery space directly above said draft sill.

8. (Original) The railroad hopper car of claim 7 wherein a brake reservoir is also at least partially lodged in said machinery space.

9. (Currently amended) The railroad hopper car of claim [[1]] 6 wherein:

said shear plate is mounted above, and to, said main bolster and defines an upper flange thereof;

said main bolster has a lower flange downwardly spaced from said upper flange, said lower flange terminating at respective distal end portions at either side of said car;

said car includes a side sill running along said car between said first and second end sections;

said side sill has an upper flange, said upper flange of said side sill being substantially co-planar with, and connected to, said shear plate; and

said side sill has a lower flange, said lower flange of said side sill being substantially co-planar with a respective one of said distal end portions of said lower flange of said main bolster.

10. (Original) The railroad hopper car of claim 9 wherein said shear plate defines an upper flange of said draft sill whereby said draft sill upper flange, said shear plate and said side sill upper flange are all substantially co-planar.

11. (Cancelled)

12. (Currently Amended) The railroad hopper car of claim [[11]] 16 wherein said laterally extending reinforcement member includes a first edge mounted cross-wise along said first end slope sheet; a second edge mounted cross-wise along said first end slope sheet and spaced from said first edge, and a third portion mounted across said shear plate of said first end section.

13. (Currently Amended) The railroad hopper car of claim [[11]] 16 wherein said laterally extending member has a pair of first and second spaced apart toes, and said laterally extending member is mounted toes-in against said first end slope sheet, whereby said first hollow section beam is defined by said laterally extending reinforcement and said first end slope sheet.

14. (Currently Amended) The railroad hopper car of claim [[11]] 16 wherein said laterally extending reinforcement has, when seen in section, a first toe, a second toe, and a back; said laterally extending reinforcement is mounted toes-in against said first end slope sheet; and said back is mounted to said shear plate of said first end section.

15. (Original) The railroad hopper car of claim 14 wherein said laterally extending reinforcement is an angle iron mounted toes-in to said first end slope sheet.

16. (Currently Amended) A railroad hopper car, said hopper car comprising:

a hopper;

first and second end sections for carriage by respective first and second rail road car trucks for rolling motion along railroad tracks in a longitudinal direction;

said hopper being suspended between said first and second end sections, said hopper having a discharge section through which to release lading, and a first end slope sheet oriented toward said first end section, said first end slope sheet being inclined in the longitudinal direction to feed said discharge section;

said first end section including a draft sill extending in the longitudinal direction, a main bolster extending cross-wise to said draft sill, and a shear plate mounted to said draft

sill and to said main bolster, said shear plate extending lengthwise along said draft sill and cross-wise from side to side of said hopper car;

said first end slope sheet of said hopper over-hanging said shear plate of said first end section;

first and second side walls running lengthwise along first and second sides of said car, said first end slope sheet of said hopper extending cross-wise between said first and second side walls;

a first laterally extending reinforcement mounted cross-wise to said first end slope sheet adjacent to said shear plate;

said shear plate of said first end section being connected to said first laterally extending reinforcement;

said first end slope sheet of said first end section being connected to said first laterally extending reinforcement;

said first laterally extending reinforcement defining part of a first hollow section beam extending across said hopper car between said first and second side walls;

~~The railroad hopper car of claim 11 wherein:~~

said hopper car being free of longitudinally oriented elephant ears extending between said draft sill and said end slope sheet;

said hopper car has a first end wall member running cross-wise between said first and second side walls;

said first end slope sheet has an upper margin that meets said first end wall member at a first junction;

said first end wall member extends upwardly from said first junction;

said first end wall member has a lower portion extending downward of said first junction;

said lower portion of said first end wall member and said upper margin of said first end slope sheet co-operate to define portions of the cross-section of a second hollow section beam extending cross-wise across said hopper car between said first and second side walls.

17. (Original) The railroad hopper car of claim 16 wherein said lower portion of said first end wall member has a lower margin that is bent to meet said upper margin of said first end slope sheet at a location lower than said first junction.

18. (Original) The railroad hopper car of claim 16 wherein said first end wall member has an upper margin that terminates at a top chord, said top chord extending from side to side of said hopper car.

19. (Original) The railroad hopper car of claim 16 wherein said car includes an upstanding end post, said end post being mounted over said draft sill longitudinally outboard of said main bolster and extending upwardly therefrom to meet said first end wall member.

20. (Original) The railroad hopper car of claim 16 wherein an intermediate beam extends across said first end slope sheet between said first and second side walls at a position intermediate said first hollow section beam and said second hollow section beam.

21. (Original) The railroad hopper car of claim 20 wherein said intermediate beam includes a cross-wise extending structural member mounted toes-in against said first end slope sheet to define a closed hollow section.

22. (Original) The railroad hopper car of claim 16 wherein said first and second side walls of said hopper car define sidewalls of said hopper, and said first and second side walls include end portions that are stepped laterally inboard, and said second hollow section beam extends between said end portions of said first and second side walls that are stepped laterally inboard.

23. (Cancelled)

25. (Currently Amended) A railroad hopper car, said hopper car comprising:

a hopper;

first and second end sections for carriage by respective first and second rail road car trucks for rolling motion along railroad tracks in a longitudinal direction;

said hopper being suspended between said first and second end sections, said hopper having a discharge section through which to release lading, and a first end slope sheet oriented toward said first end section, said first end slope sheet being inclined in the longitudinal direction to feed said discharge section;

said first end section including a draft sill extending in the longitudinal direction, a main bolster extending cross-wise to said draft sill, and a shear plate mounted to said draft sill and to said main bolster, said shear plate extending lengthwise along said draft sill and cross-wise from side to side of said hopper car;

said first end slope sheet of said hopper over-hanging said shear plate of said first end section;

first and second side walls running lengthwise along first and second sides of said car, said first end slope sheet of said hopper extending cross-wise between said first and second side walls;

a first laterally extending reinforcement mounted cross-wise to said first end slope sheet adjacent to said shear plate;

said shear plate of said first end section being connected to said first laterally extending reinforcement;

said first end slope sheet of said first end section being connected to said first laterally extending reinforcement;

said first laterally extending reinforcement defining part of a first hollow section beam extending across said hopper car between said first and second side walls;

~~The railroad hopper car of claim 11 wherein:~~

said hopper car being free of longitudinally oriented shear webs ears extending between said draft sill and said end slope sheet;

said hopper car has second, and third hollow section beams as well as said first hollow section beam, said first, second and third hollow section beams extending thereacross between said first and second side walls thereof;

said first end slope sheet has an uppermost margin, and said second hollow section beam runs along said uppermost margin of said first end slope sheet;

said third hollow section beam is located intermediate said first and second hollow section beams;

said hopper car has an end post mounted over said draft sill, said end post being located longitudinally outboard of said main bolster of said first end section;

said end post extends upwardly to meet said second hollow section beam;

said hopper car has first and second side sills running longitudinally along either side thereof, said first and second side walls extending upwardly of said first and second side sills respectively;

said first and second side sills mate with first and second ends of said main bolster of said first end section; and

said first and second side sills have upper flanges that mate with said shear plate of said first and section.

26. (Original) The railroad hopper car of claim 25 wherein:

there is an end wall that extends from sidewall to sidewall;

said end wall has an upper portion that has an upper margin terminating at a top chord of

said end wall;

said first end slope sheet has an uppermost margin, said uppermost margin of said first end slope sheet meeting said end wall along a first juncture;

said end wall has a lower portion extending below said first juncture, said lower portion being bent to define a portion of said second hollow section beam; and

said end post extends past said second hollow section beam along said end wall to mate with said top chord of said end wall.

27. (Currently Amended) A railroad hopper car, said hopper car comprising:

a hopper;

first and second end sections for carriage by respective first and second rail road car trucks for rolling motion along railroad tracks in a longitudinal direction;

said hopper being suspended between said first and second end sections, said hopper having a discharge section through which to release lading, and a first end slope sheet oriented toward said first end section, said first end slope sheet being inclined in the longitudinal direction to feed said discharge section;

said first end section including a draft sill extending in the longitudinal direction, a main bolster extending cross-wise to said draft sill, and a shear plate mounted to said draft sill and to said main bolster, said shear plate extending lengthwise along said draft sill and cross-wise from side to side of said hopper car;

said first end slope sheet of said hopper over-hanging said shear plate of said first end section;

first and second side walls running lengthwise along first and second sides of said car, said first end slope sheet of said hopper extending cross-wise between said first and second side walls;

a first laterally extending reinforcement mounted cross-wise to said first end slope sheet adjacent to said shear plate;

said shear plate of said first end section being connected to said first laterally extending reinforcement;

said first end slope sheet of said first end section being connected to said first laterally extending reinforcement;

said first laterally extending reinforcement defining part of a first hollow section beam extending across said hopper car between said first and second side walls;

~~The railroad hopper car of claim 11 wherein:~~

said hopper car being free of longitudinally oriented elephant ears extending between said

draft sill and said end slope sheet;

said main bolster of said first end section of said railroad hopper car has first and second ends at laterally outboard extremities thereof;

said hopper car has first and second corner posts mounted at said first and second ends of said main bolster of said first end section, said corner posts extending upwardly from said main bolster to said first end slope sheet;

said draft sill has a longitudinally outboard end;

an end post stands upwardly of said longitudinally outboard end of said draft sill;

a machinery space is defined above said shear plate, below said first end slope sheet, longitudinally inboard of said end post, and between said corner posts; and

said machinery space is free of any other primary structure.

28. (Original) The railroad hopper car of claim 27 wherein:

said hopper has a movable door by which egress of lading is governed;

said hopper car has an actuator and a drive train, said drive train being connected between said actuator and said door, said actuator being operable to move said door; and

said actuator is mounted in said machinery space.

29. (Original) The railroad hopper car of claim 28 wherein said first side wall has an aperture formed therein at a location higher than said shear plate, lower than said first end slope sheet, and longitudinally inboard of said first corner post.

30. (Currently Amended) The railroad hopper car of claim [[11]] 27 wherein [[:]]

~~said main bolster of said first end section has first and second ends;~~

~~said car has first and second corner posts extending upwardly from said first and second ends of said bolster respectively; and~~

said first and second side walls of said car have openings defined therein longitudinally inboard of said respective corner posts, above said shear plate, and below said first end slope sheet.

31 – 32. (Cancelled)

33. (Currently Amended) A railroad hopper car, said hopper car comprising:

a hopper;

first and second end sections for carriage by respective first and second rail road car trucks for rolling motion along railroad tracks in a longitudinal direction;

said hopper being suspended between said first and second end sections, said hopper having a discharge section through which to release lading, and a first end slope sheet oriented toward said first end section, said first end slope sheet being inclined in the longitudinal direction to feed said discharge section;

said first end section including a draft sill extending in the longitudinal direction, a main bolster extending cross-wise to said draft sill, and a shear plate overlying said draft sill and said main bolster, said shear plate extending along said draft sill and cross-wise from side to side of said hopper car;

said first end slope sheet over-hanging said shear plate of said first end section;

first and second side walls running lengthwise along first and second sides of said car, said first end slope sheet of said hopper extending cross-wise between said first and second side walls;

there being a first end wall extending between said first and second side walls;

said first end slope sheet having an uppermost margin, said uppermost margin meeting said first end wall at a first junction;

said hopper car having a first beam extending cross-wise between said first and second side walls at said first junction of said uppermost margin of said first end slope sheet and said first end wall, said first beam being a beam of hollow section;

said first end wall has an upper portion and a lower portion;

said upper portion of said first end wall extends upwardly of said first junction of said uppermost margin of said first end slope sheet and said first end wall;

said lower portion of said end wall extends downwardly of said first junction of said uppermost margin of said first end slope sheet and said first end wall; and

said lower portion of said first end wall forms part of said first beam;

said draft sill having longitudinally extending draft sill webs;

said first end section being free of longitudinally oriented elephant ears extending upwardly of said draft sill webs to meet said end slope sheet;

~~The railroad hopper car of claim 32 wherein~~ said lower portion of said first end wall has a margin, and said margin is bent to mate with said first end slope sheet as a second junction distant from the first junction, said lower portion of said first end wall and said uppermost margin of said first end slope sheet co-operating to define said first beam.

34. (Original) The railroad hopper car of claim 33 wherein an end post is mounted over said draft sill outboard of said main bolster, said end post extending upwardly to meet said first beam.

35. (Original) The railroad hopper car of claim 34 wherein:

said upper portion of said first end wall extends upwardly of said first junction to end at a top chord; said top chord extends across said hopper car between said first and second side walls; and

said end post extends past said first beam to terminate at said top chord.

36. (Original) The railroad hopper car of claim 33 wherein a second beam is mounted across said first end slope sheet adjacent said shear plate.

37. (Original) The railroad hopper car of claim 36 wherein a third beam is mounted across said first end slope sheet intermediate said first and second beams, and said third beam is formed of a structural member mounted toes-in against said first end slope sheet to define an hollow section.

38. (Original) The railroad hopper car of claim 34 wherein:

said main bolster has first and second ends; and

respective first and second corner posts are mounted to said first and second ends of said main bolster and extend upwardly therefrom.

39. (Original) The railroad hopper car of claim 38 wherein: a machinery space is defined above said shear plate, in the lee of said first end slope sheet, longitudinally inboard of said end post and between said first and second corner posts; and said machinery space is free of any other primary structure.

40. (Original) The railroad hopper car of claim 39 wherein:

said first side wall has an aperture formed therein in a location that is longitudinally inboard of said first corner post, above said shear plate, and leeward of said first end slope sheet;

said hopper has a movable gate operable to govern egress of lading from said hopper;

there is an actuator mounted in said machinery space, and a drive train connecting said actuator to said gate.

41 – 42. (Cancelled)

43. (New) A railroad hopper car, said hopper car comprising:

a hopper;

first and second end sections for carriage by respective first and second rail road car trucks for rolling motion along railroad tracks in a longitudinal direction;

said hopper being suspended between said first and second end sections, said hopper having a discharge section through which to release lading, and a first end slope sheet oriented toward said first end section, said first end slope sheet being inclined in the longitudinal direction to feed said discharge section;

said first end section including a draft sill extending in the longitudinal direction, said draft sill having first and second spaced apart longitudinally running draft sill webs and a draft pocket defined therebetween;

said first end section including a main bolster extending cross-wise to said draft sill;

said first end section having a truck center where said main bolster meets said draft sill;

said draft sill having a striker end longitudinally outboard of said truck center;

said first end section including a shear plate;

said shear plate overlying said draft sill webs and said main bolster, said shear plate extending longitudinally along said draft sill and cross-wise from side to side of said hopper car;

said shear plate having an outboard margin running across said car distant from said truck center and proximate said striker end;

said first end slope sheet over-hanging said shear plate of said first end section;

first and second side walls running lengthwise along first and second sides of said car, said first end slope sheet of said hopper extending cross-wise between said first and second side walls;

there being a first end wall extending between said first and second side walls;

said first end slope sheet having an uppermost margin, said uppermost margin meeting said first end wall at a first junction;

said hopper car having a first beam extending cross-wise between said first and second side walls at said first junction of said uppermost margin of said first end slope sheet and said first end wall, said first beam being a beam of hollow section;

said first end wall is surmounted by a cross-wise running top chord;

said first end wall includes a panel extending downwardly from said cross-wise running top chord;

said first end section includes an end post extending upwardly of said draft sill, said end post

being mounted above said draft sill distant from said truck center and proximate said striker end;

said end post extending upwardly to meet said first beam and said top chord;

said first end section being free of longitudinally oriented elephant ears extending upwardly of said draft sill webs of said draft sill to meet said first end slope sheet; and

said hopper car having a second beam extending cross-wise between said first and second side walls, said second beam being a beam of hollow section; and

said second beam being connected to said shear plate.

44. (New) The railroad hopper car of claim 43 wherein a third beam is mounted across said first end slope sheet intermediate said first and second beams.

45. (New) The railroad hopper car of claim 44 wherein said third beam is formed of a structural member mounted toes-in against said first end slope sheet to define an hollow section.

46. (New) The railroad hopper car of claim 43 wherein:

said main bolster has first and second ends; and

respective first and second corner posts are mounted to said first and second ends of said main bolster and extend upwardly therefrom to meet said first end slope sheet.

47. (New) The railroad hopper car of claim 46 wherein:

a machinery space is defined above said shear plate and under said first end slope sheet; and

a door actuator is mounted above said shear plate and under said first end slope sheet.

48. (New) The railroad hopper car of claim 46 wherein:

a machinery space is defined above said shear plate and under said first end slope sheet;

said first side wall has an aperture formed therein in a location that is longitudinally inboard of said first corner post, above said shear plate, and leeward of said first end slope sheet;

said hopper has a movable gate operable to govern egress of lading from said hopper;

there is an actuator mounted in said machinery space, and a drive train connecting said actuator to said gate.

49. (New) The railroad hopper car of claim 43 wherein:

said main bolster has first and second ends; and

respective first and second corner posts are mounted to said first and second ends of said main bolster and extend upwardly therefrom;

said first side wall has an opening formed therein, said opening being located longitudinally inboard of said first corner post, upward of said shear plate, leeward of said first end slope sheet.

50. (New) The railroad hopper car of claim 43 wherein said draft sill has a longitudinally outboard end, and a striker plate mounted at said longitudinally outboard end; and said draft sill has a length between said truck center and said striker plate that is less than 50 inches.

51. (New) The railroad hopper car of claim 43 wherein

said railroad hopper car has first and second end section, and said hopper is carried thereby;

said first and second side walls each have a respective side sill and a top chord;

said first side wall extends from said side sill to said top chord;

said first side wall has a predominantly upwardly running side wall stiffener mounted thereto, said side wall stiffener being located at a longitudinal station intermediate the trucks;

said first side wall having a first region, said first region being a lower region thereof;

said first side wall having a second region, said second region being an upper region thereof;

said side wall stiffener having a first portion, said first portion being a lower portion thereof, said first portion being mounted to said first region of said first side wall;

said side wall stiffener having a second portion, said second portion being an upper portion thereof, said second portion being mounted to said second region of said side wall;

said first portion of said first side wall stiffener being laterally outboard of said first region of said first side wall;

said second portion of said side wall stiffener being laterally inboard of said second region of said first side wall;

said side wall having a continuous section between said first and second regions thereof; and

said side wall stiffener having web continuity between said first and second portions thereof.

52. (New) The railroad hopper car of claim 51 wherein said first and second portions of said side wall stiffener are substantially co-planar, and are substantially vertically aligned when seen in a sectional view looking along the car.

53. (New) The railroad hopper car of claim 52 wherein said first side wall has a third region

intermediate said first and second regions, said third region including a side sheet transition portion passing across said side wall stiffener from an inboard margin thereof to an outboard margin thereof, and said stiffener having vertical web continuity through said transition portion.

54. (New) The railroad hopper car of claim 51 wherein:

said first side wall has a third region intermediate said first and second regions, said third region including a side sheet transition portion passing across said side wall stiffener from an inboard margin thereof to an outboard margin thereof;

said hopper includes first and second sloped side sheets; and

said first sloped side sheet meets said first side wall at said transition portion.

55. (New) The railroad hopper car of claim 54 wherein said first side wall has an overall height from said side sill to said top chord, L, and said transition portion is located a distance above said side sill that is in the range of ¼ to 2/3 L.

Remarks

1. Status of the Case

Claims 1 – 42 were pending in this case.
Claims 1 – 10 stand allowed.
Claims 11 – 15, 23, 24, 30 – 32, 41 and 42 stand rejected on a variety of bases.
Claims 16 – 22, 25 – 29 and 33 – 40 are objected to.

2. Submission of IDS Materials

The Applicant has submitted a fairly extensive listing of Information Disclosure Statement materials herewith. There materials are intended to include:

(a) non-patent admitted prior art, including photographs and drawings of cars built and operated in public before the date of the present invention; and

(b) patent references relating to hopper car cars and gondolas.

The Applicant also draws the Examiner's attention to the following co-pending cases:

1) USSN 13/195,664 filed May 11, 2011
2) USSN 12/694,896 filed January 27, 2010
3) USSN 12/781,741 filed May 14, 2010, 2010
4) USSN 12/559,065 filed September 14, 2009

The Applicant draws the Examiner's attention to the non-patent references. The original search in this matter may not necessarily have included comparable materials.

The reproduction quality of DM & IR Drawings 8760 of April 8, 1950 is very poor. However, when seen in full scale it shows a very short draft sill dimensions. It also indicates rivet-installed rear draft gear having trailing ends extending longitudinally inboard of the truck center. This car appears to be substantially the same design as the DM & IR car shown at page 283 of the *1943 Cyclopedia*.

3. Amendments to the Claims

Claims 1 – 4 have been cancelled.
Claim 6 has been re-written in independent form.
Claims 5 and 9 have been amended to depend from claim 6.
Claim 11 has been cancelled.
Claim 16 has been re-written in independent form.
Claims 12 – 15 have been amended to depend from claim 16.
Claim 23 has been cancelled.
Claims 25 and 27 have been re-written in independent form.
Claims 31 and 32 have been cancelled. Claim 31 has been replaced by new independent claim 43.
Claim 33 has been re-written in independent form.
Claims 41 and 42 have been cancelled.
New claims 43 – 55 have been introduced.

The Applicant respectfully submits that these amendments are thought to place the case in condition for allowance.

4. Concluding Commentary

The Applicant believes that the former rejections are moot in light of the current amendments. The Applicant therefore requests the reconsideration and withdrawal of all of the rejections made in the case, and the allowance of the claims.

The Applicant therefore requests early and favorable disposition of this matter.

Yours very truly,

Date October 13, 2011

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Electronic Patent Application Fee Transmittal

Application Number:	12816660
Filing Date:	16-Jun-2010
Title of Invention:	RAILROAD GONDOLA CAR STRUCTURE AND MECHANISM THEREFOR
First Named Inventor/Applicant Name:	James W. Forbes
Filer:	Michael Howard Minns
Attorney Docket Number:	200405.00139

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Independent claims in excess of 3	1201	3	250	750
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension - 2 months with $0 paid	1252	1	560	560
Miscellaneous:				
Request for continued examination	1801	1	930	930
		Total in USD ($)		**2240**

Electronic Acknowledgement Receipt

EFS ID:	11183895
Application Number:	12816660
International Application Number:	
Confirmation Number:	3873
Title of Invention:	RAILROAD GONDOLA CAR STRUCTURE AND MECHANISM THEREFOR
First Named Inventor/Applicant Name:	James W. Forbes
Customer Number:	21324
Filer:	Michael Howard Minns
Filer Authorized By:	
Attorney Docket Number:	200405.00139
Receipt Date:	13-OCT-2011
Filing Date:	16-JUN-2010
Time Stamp:	18:05:20
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$2240
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)

1	Request for Continued Examination (RCE)	RCE.pdf	697845 2dc00cae1d5929b0a359e8ecfc944c38175b1538	no	3
Warnings:					
Information:					
2	Information Disclosure Statement (IDS) Form (SB08)	US_IDS_Part1of3.pdf	613609 02d69e609c0195782e4d296f57338890ac401a68	no	7
Warnings:					
Information:					
3	Information Disclosure Statement (IDS) Form (SB08)	US_IDS_Part2of3.pdf	612984 ba01ca9561c0e0b13550a63d6a66b26f729b2cba	no	6
Warnings:					
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4	Information Disclosure Statement (IDS) Form (SB08)	US_IDS_Part3of3.pdf	612649 06708303202ec760a674420b8412d429f059c132	no	6
Warnings:					
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5	Foreign Reference	EP00543279B1.pdf	739805 b9708113193031b00ebc41a89a82b63ec4b8e73b	no	9
Warnings:					
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6	Foreign Reference	EP1798103A2.pdf	149572 c2bdb3542d5143297bd798969855d7cc7aa758b4	no	6
Warnings:					
Information:					
7	Foreign Reference	GB1318571A.pdf	464774 11ec0844c4287c1c3a0071a948795d3811f67062	no	4
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8	Foreign Reference	GB2013598A.pdf	649276 9810979d2b72520cb6d374880a6cd9096f306ed2	no	7
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9	Foreign Reference	CA1082524.pdf	2158624 7e3fd40229a73ffbe1acad5dd4ad3b1f95042470	no	19
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10	Foreign Reference	CN101486347.pdf	651258 fd73a1c7f89de7871af3a5e44bcfc7d7f785af61	no	6
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11	Foreign Reference	EP1790547A1.pdf	571067 f248786c9b37744ed0b140332fe8dec0bbc6fe13	no	8
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12	Non Patent Literature	5PhotosQIT.pdf	1913366 be8f0a6656132ddb9ddb12a6da2da374fbdd7b07	no	5
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Information:					
13	Non Patent Literature	QITdrawing.pdf	171273 d0fd122306385fc228c4269b36aed0e1f32cd9f2	no	1
Warnings:					
Information:					
14	Non Patent Literature	2SheetsDetails.pdf	159378 85361af1394353ce5f98fc4f84bada4ba4a39bd7	no	2
Warnings:					
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15	Non Patent Literature	ReproductionDesignDrawing.pdf	536642 5b2f4c3eb868191ece98c5c503602fe687053760	no	1
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16	Non Patent Literature	CarBldrsCyclo1937.pdf	4764304 59820d83e4835c4d58cfbdea601547cd6b1ea36e	no	9
Warnings:					
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17	Non Patent Literature	CarBldrsCyclo1943.pdf	3835089 8c8769800c72b2f1a6c16a26bd8d7b9e4080eea1	no	8
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18	Non Patent Literature	CarBldrsCyclo1957.pdf	3968566 5222354f8da6113b8737a3723238fa14f3910802	no	7
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19	Non Patent Literature	CarBldrsCyclo1961.pdf	6462196 6ed229fee7dfb3d2ce2532d46dd11d6c68dcb9ff	no	10
Warnings:					
Information:					
20	Non Patent Literature	CarLocoCyclo1966.pdf	3899137 b4670f2ac55e4d51a4cea7ac38871bbade892aeb	no	10
Warnings:					
Information:					
21		Amendment.pdf	148762 85eb1a4cb0b034d69d488afb1378985e5799fdf8	yes	17

Multipart Description/PDF files in .zip description

Document Description	Start	End
Amendment Submitted/Entered with Filing of CPA/RCE	1	1
Claims	2	15
Applicant Arguments/Remarks Made in an Amendment	16	17

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22	Fee Worksheet (SB06)	fee-info.pdf	34016 4cc8768d8b996d1f86601234a8907a63c6b6d6b1	no	2
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If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**		
	Application Number	12816660
	Filing Date	2010-06-16
	First Named Inventor	James W. Forbes
	Art Unit	3617
	Examiner Name	Jason C. Smith
	Attorney Docket Number	200405.00139

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Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	4250814		1981-02-17	Stark et al.	
	2	3931768		1976-01-13	Price et al.	
	3	5823118		1998-10-20	Manstrom	
	4	4232989		1980-11-11	Miller	
	5	3800711		1974-04-02	Tuttle	
	6	5261333		1993-11-16	Miller	
	7	3717109		1973-02-20	Miller	
	8	1421439		1922-07-04	Finckh	

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Art Unit	3617
Examiner Name	Jason C. Smith
Attorney Docket Number	200405.00139

	9	3863986		1975-02-04	Mentessi	
	10	3878794		1975-04-22	Adler	
	11	3994238		1976-11-30	Adler	
	12	4106813		1978-08-15	Goodbary	
	13	4120409		1978-10-17	vander Werff	
	14	4740130		1988-04-26	Prins	
	15	5144895		1992-09-08	Murray	
	16	5163372		1992-11-17	Galvan et al.	
	17	0763186		1904-06-21	Johnson	
	18	3173381		1965-03-16	Charles et al.	
	19	3187684		1965-06-08	Ortner	

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	1	0543279	EP	B1	1995-05-17	ABB HENSCHEL WAGGON UNI-ON		☐
	2	1798103	EP	A1	2007-06-20	Wagony Swidnica SA		☐
	3	1318571	GB		1973-05-31			☐
	4	2013598	GB		1979-08-15	Luossavaara-Kiirunavaara Aktiebolag		☐
	5	1082524	CA	A1	2009-07-22			☐
	6	101486347	CN		2009-07-22			☐

INFORMATION DISCLOSURE STATEMENT BY APPLICANT
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Art Unit	3617
Examiner Name	Jason C. Smith
Attorney Docket Number	200405.00139

	7	EP1790547A1	EP			2007-05-30		☐

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	1	5 Photographs of Quebec Iron and Titanium (QIT) ore hopper car No. 556, dated August 15, 2007	☐
	2	Drawing of QIT car dated August 27, 2007	☐
	3	2 Sheets of Details of End Structure of an Admitted Prior Art Grain Car of National Steel Car Showing End Post, Lateral Intermediate Stub Wall, Elephant Ears Arrangement and End Slope Sheet to Shear Plate Connection at least as early as January 1, 2001	☐
	4	Reproduction of Design Drawing of Dulth, Missabi & Iron Range (DM&IR) Open Topped Ore Hopper Car General Arrangement Drawing 8760 Drawn April 8, 1950, (Quality Poor in Original), Showing Rear Draft Stops Extending Inboard of Truck Center.	☐
	5	FREIGHT CARS: Hopper, Ore; Car Builders' Cyclopedia, 1937, pp. 313-320, 14th ed., Simmons-Boardman Publishing Corporation, New York, NY.	☐
	6	A.C.F. Covered and Open Top Hopper Cars; Car Builders' Cyclopedia, 1943, pp. 281-289, 16th ed., Simmons-Boardman Publishing Corporation, New York, NY.	☐
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	8	FREIGHT CARS: Hopper, Ore, Class HMA; Car Builders' Cyclopedia, 1961, pp. 246-258, 21st ed., Simmons-Boardman Publishing Corporation, New York, NY.	☐

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	Filing Date	2010-06-16
	First Named Inventor	James W. Forbes
	Art Unit	3617
	Examiner Name	Jason C. Smith
	Attorney Docket Number	200405.00139

	9	Car and Locomotive Cyclopedia, 1966, 10 pages, 1st ed., Simmons-Boardman Publishing Corporation, New York, NY.	☐

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